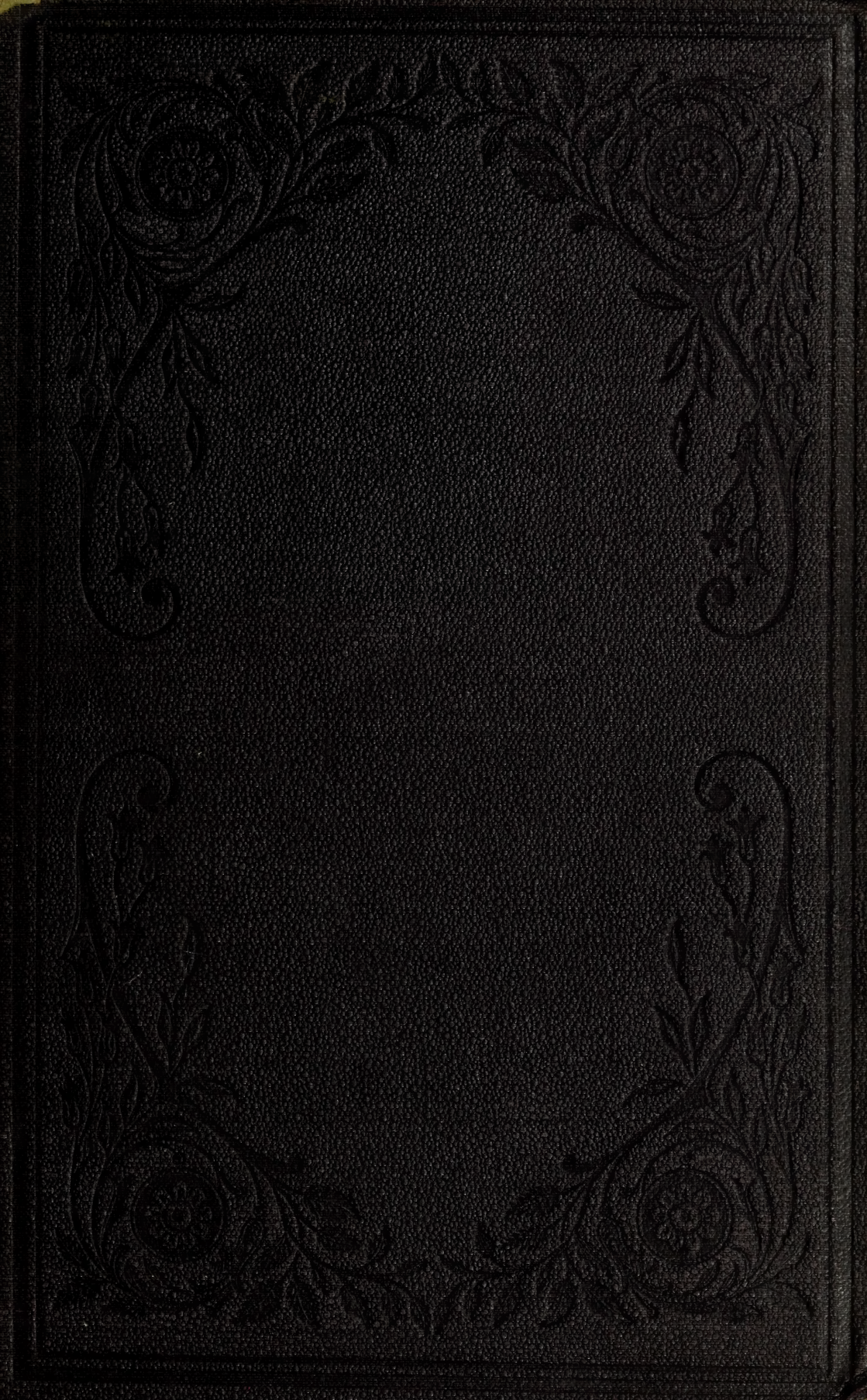




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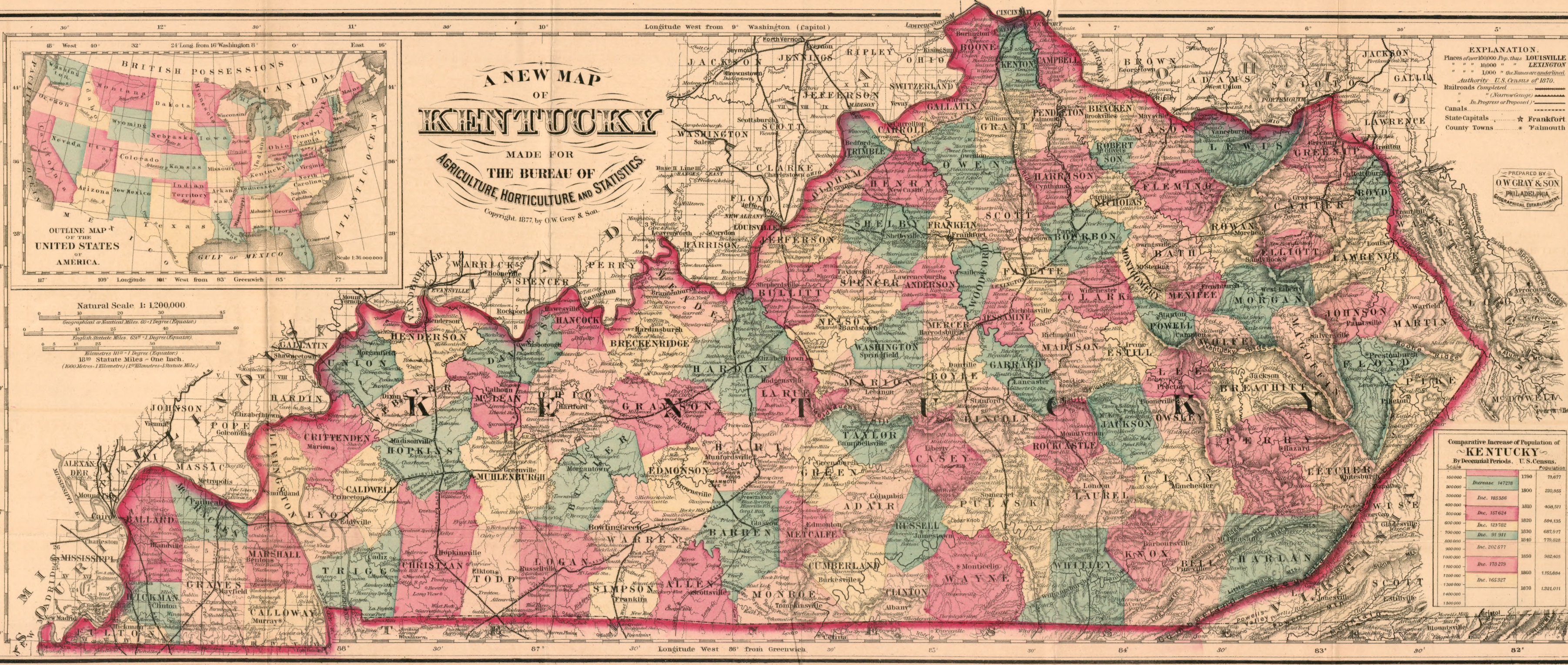


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TICULTURE,



A NEW MAP
OF
KENTUCKY

MADE FOR
THE BUREAU OF
AGRICULTURE, HORTICULTURE AND STATISTICS
Copyright, 1877, by O.W. Gray & Son.

EXPLANATION.
Places of over 100,000 Pop. thus **LOUISVILLE**
" " " 10,000 " **LEXINGTON**
" " " 1,000 " the Names are underlined
Authority: U.S. Census of 1870.
Railroads Completed (Narrow Gauge)
" In Progress or Proposed
Canals
State Capitals **Frankfort**
County Towns **Falmouth**

PREPARED BY
O.W. GRAY & SON
PHILADELPHIA
GEOGRAPHICAL ESTABLISHMENT

Comparative Increase of Population of
KENTUCKY
By Decennial Periods. U. S. Census.

Scale	Population
100,000	1790 73,677
200,000	Increase 147,728 1800 220,955
300,000	Inc. 185,556 1810 406,511
400,000	Inc. 157,624 1820 564,135
500,000	Inc. 123,782 1830 687,917
600,000	Inc. 91,911 1840 779,828
700,000	Inc. 202,577 1850 982,405
800,000	Inc. 173,279 1860 1,155,684
900,000	Inc. 165,327 1870 1,321,011

KENTUCKY:

ITS

RESOURCES AND PRESENT CONDITION.

THE FIRST ANNUAL REPORT

PREPARED BY

WINSTON J. DAVIE, M. A.,

COMMISSIONER OF THE STATE BUREAU OF AGRICULTURE, HORTICULTURE,
AND STATISTICS.

FOR GENERAL DISTRIBUTION.

FRANKFORT, KY.:

PRINTED AT THE KENTUCKY YEOMAN OFFICE.

S. I. M. MAJOR, PUBLIC PRINTER.

1878.

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FRANKFORT, KY., January 1, 1878.

To His Excellency, JAMES B. McCREARY, Governor of Kentucky:

SIR: In accordance with the intention of the third and sixth sections of the act creating this Bureau, I have compiled and written the following Report, which is the first of the annual series contemplated by said act, and I submit the same to you for publication and general distribution. To prepare this Report in compliance with the law has been a work of great labor in an office destitute of clerical assistance, and crowded with a large local and foreign correspondence; yet I trust it has been done in such a manner that it will be of great benefit to all industries in our own State, and will afford much information to emigrants of other States and countries seeking a home in Kentucky. I have called the Report by the title of "Kentucky: its Resources and Present Condition," on account of the great variety of subjects treated of in the work.

I am, very respectfully,

W. J. DAVIE,

Com'r of Agriculture, Horticulture, and Statistics.

PREFACE.

This Report will doubtless appear rather different from the usual works issued from similar Bureaus of other States. The cause in part for this is, that the act creating this Bureau requires a book descriptive of the peculiar features and development of our State, written so plainly that our people of every class can comprehend it. It also requires that it shall be written with an especial eye to the development of the agricultural, horticultural, mechanical, and commercial industries of our country.

For these reasons, as well as to make what I believed would be a work suited to the present wants of the citizens of Kentucky, and those emigrants from other countries who desire to come and settle among us, I have made it such as the reader will find it. Many of these pages are a mere digest of facts already before the public, but divested of cumbersome diction and uninteresting details. Some are also furnished from my correspondence, and wrought into the general plan of the work.

In gaining the necessary information for the report, I have used freely the most excellent Geological Reports of Dr. David Dale Owen and Prof. N. S. Shaler, also the reliable, well-written "History of Kentucky," by Col. Richard H. Collins, and the finely arranged Auditor's Report of that excellent officer, Col. D. Howard Smith, and the well-digested School Reports of Rev. Dr. H. A. M. Henderson.

The geological map of Prof. Shaler, in the latter part of the Report, is not altogether correct in the marking of the county lines, but is in the main correct in the location of the different geological formations, as they are indicated by shading of cross-lines, varied according to the direction of the index. This map was made in 1875, as preliminary to a more perfect geological and topographical map, which will follow in due time. The special geographical map, which I have had executed by Messrs. Gray & Son, is the best and most correct issued up to this date; but even in this there are errors, owing to the poor system of the original land surveys in our State, and the want of a proper knowledge by local surveyors of the variations of the compass. These errors can only be corrected when the more perfect map of the Geological Survey is completed. The statistics and statistical tables come up to the present

time, but only include the crops produced in 1876, though listed in 1877. The articles upon agricultural and horticultural subjects are written in accordance with the latest experiments in these branches, as made by the best chemists, farmers, and gardeners in our country. The first 108 pages are taken from the Centennial pamphlet of Prof. Shaler, and the "Emigration Pamphlet" written by myself, because these pages were stereotyped, and the plates belonged to the State, and also in order to reproduce the valuable information there given. A more extended notice of each county should have been given, but the want of space and the press of other desirable matter prevented.

W. J. DAVIE.

A

GENERAL ACCOUNT

OF THE

COMMONWEALTH OF KENTUCKY.

GEOGRAPHY.

Position.—The Commonwealth of Kentucky—situated between latitude $36^{\circ} 30'$ and $39^{\circ} 06'$ north, and longitude $5^{\circ} 00'$ and $12^{\circ} 38'$ west, from Washington—includes about forty thousand square miles of area, extending for six hundred and forty-two and a half miles along the south bank of the Ohio River, from its junction with the Mississippi to the mouth of the Chatterawah or Big Sandy. This river forms the northern, north-western, and north-eastern borders of the State. A part of its north-eastern border, one hundred and twenty miles, is formed by the Chatterawah River; a south-eastern face of about one hundred and thirty miles has a natural boundary in the several ranges which receive the common name of Cumberland Mountains. The southern face alone is an arbitrary line of two hundred and ninety-five miles in length. The western boundary of about fifty miles is formed by the Mississippi River.

A glance at the accompanying map will make it plain that the region occupied by this Commonwealth has a position of peculiar importance with reference to the great feature-lines of the continent. The Mississippi-River system is the key to the continent. Those parts which lie beyond its borders are, by their limited area or their severe conditions of climate, relatively of minor importance. In this system the State of Kentucky, all things being considered, occupies a most important place. Its western border is only one thousand and

seventy-five miles* from the mouth of the Mississippi, and its eastern boundary is within five hundred miles of the Atlantic ports.

The special features of position to be considered in measuring the importance of this Commonwealth are its central place with reference to the Valley of the Mississippi, and the advantages it has from its extended contact with the river system of that valley. More than any other State in America it abounds in rivers. Including the Ohio and Mississippi Rivers, where they bound its borders, the State has within its limits rather more than four thousand miles of rivers, which are more or less completely navigable. Improvements of small cost will give this amount of navigation with complete permanency, except for an average of about fifteen days per annum, when they are ice-bound.

GENERAL GEOLOGY.

Just as the State of Kentucky is geographically but a part of the Mississippi Valley, so it is geologically composed of a series of rocks which extend far and wide over the same region. On the eastern line, between Cumberland Gap and Pound Gap, it is generally in sight of the old crystalline rocks of the Blue Ridge, or original axis of the Appalachian Chain, and is closely bordered by rocks of the middle Cambrian or Potsdam age; but the lowest exposed rocks of the State are those found at a point on the Ohio River, about twenty miles above the Licking River, where we come upon Cambrian rocks answering to the base of the Trenton period in New York, and probably to the Bala or Caradoc beds of England. This series is about six hundred feet thick, and consists principally of the remains of organic life laid down in a continually shallowing sea, interrupted by occasional invasions of coarser sediment, derived from the northward. At the close of this Cincinnati section of the Cambrian, there came the invasion of a heavier sand-flow, probably coming from the south-east, that arrested the life and formed some thick beds of rock, known in the reports

* It is 528 miles from Columbus to New Orleans by railroad, and 472 miles to Mobile.

of the Kentucky survey as the Cumberland Sandstone. After this the floor of the sea was sparingly peopled with life, during the whole of the Clinton and Niagara epochs, when it was probably deep water. This deep sunken condition of the ocean floor continued in the Devonian time, when this section seems to have been the seat of a deposition such as is now going on beneath the Sargassa Sea of the Atlantic of to-day. The decaying sea-weed and other organic matter made a bed from three hundred feet thick along Lake Erie to forty feet thick in Southern Kentucky, averaging about one hundred feet in Kentucky. This bed furnishes the rich lubricating oils of the Cumberland Valley. After this came again shallow water, and quick successive sand-invasions moving from the north, which formed several hundred feet of beds. These beds probably represent but a fraction of the time required to form the Black Shale which lies below. This part of our section is called the Waverly, and is commonly regarded as being more nearly related to the Carboniferous than to the Devonian series of rocks. After this period came a repetition of subsidence, and a cessation of the sand-invasions. During this time there was such a development of sea-lilies or stemmed Echinoderms, that this time deserves to be called the period of crinoids. This accumulation ranges in depth from a few feet along the Ohio River to five hundred or more feet under the Western Coal-field. It marks a period of tolerably deep still water, filled with lime-secreting animals. It is probably to the unbroken character of this succession of life, and especially to the crinoids with their upright stems, that we owe the uniformly massive character of many of the beds of this Subcarboniferous Limestone.

Next in the ascending series we come on the coal-bearing rocks. Their deposition was begun by the sudden shallowing of the water over this region, bringing the old sea-floor near the surface of the water, and subjecting it to alternating invasions of sand borne by strong currents, and exposures in low-lying flats covered by a dense swamp vegetation. Each of these swamp-periods answers to a coal-bed; each recurring subsidence, to the deposits of sands and shales that lie between the coals.

After the Carboniferous period, we are warranted in believing that this region was but little below the sea, and with this change it became essentially subjected to land conditions alone. The wear incident to these conditions has swept away a large part of the exposed rocks, and reduced the Carboniferous series to less than half of its original thickness.

Near to the present time there came a sudden subsidence of this whole region, that brought the low-lying western part of the State beneath the level of the sea, and retained it there while the Tertiary deposits were being formed out of the waste of the higher parts of the Mississippi Valley that still remained above the sea.*

The disturbances that have changed the position of the rocks in Kentucky have been few and far between, though they have materially affected the general structure of the State. From the mouth of the Licking south a little westerly, through Monroe County, extends a ridge or axis of elevation, the beds dipping gently, rarely over ten feet in a mile, in either direction away from it. This was in part formed during the deposition of the Lower Cambrian, but probably was completed at a much later date. This has caused the limitation of the Carboniferous beds of this region. To it in fact we owe the abundant diversity of the rock outcrops within the State. In the south-east corner of Kentucky there is a region between Straight Creek and Clear Creek, tributaries of the Cumberland, and the Virginia border, where the Appalachian disturbance has thrown the rocks into mountain folds. Here are some fine exposures of the deeper rocks brought up by the great faults of the region.

No glacial traces of the last period are known within the State, nor are the indications of the more ancient ice-periods at all distinct. This area has probably remained south of all those profound disturbances of temperature that have so greatly affected more northern regions.†

* The appended generalized section on second page of cover will give a general idea of the successions of the Kentucky rocks. Further facts can be found in the Reports of the Survey, for which see list at the end of this pamphlet.

† For further information on this subject, see the Biennial Report of N. S. Shaler for 1874-5, Kentucky Geological Survey, now in press.

Surface.—The whole of Kentucky lies within the Mississippi Basin, and within the special division of the Ohio Valley. Its principal feature-lines have been given it by the river excavations. A small area on the south-east, containing not more than four thousand square miles, lies within the disturbed region of the Alleghanies, and has a true mountain-folded structure. The remainder is essentially a plain or table-land, sloping from the south-east towards the north-west, and little broken, except by the deep-cutting river excavations. In the eastern half this table-land has an average height of about one thousand feet above the sea; the ridges often reaching to fifteen hundred, and the valleys down to seven hundred feet. The greatest difference between the bottom of any one excavation valley and the borders of the divide does not exceed about seven hundred feet, and is usually about half this amount. Eight degrees west of Washington the country begins to sink down rapidly to the west. The cause of this change will be explained in the geological description of the State. Its effect is to carry the upper surface of this table-land gradually downwards, until along the Mississippi its average height is not more than three hundred feet above the sea, and the average difference between the bottoms of the valleys and the tops of the ridges is not over fifty feet. This considerable height of the State above the sea is of great advantage in securing it against fevers, from which it may be said to be practically exempt, except in a narrow belt in the extreme western district, near the borders of the swamp regions.

Although the general surface of the State is that of a table-land sloping towards the Ohio River, and consequently towards the north-west, it has many subordinate features which should be separately described. All that part of its surface indicated as Tertiary on the accompanying map is rather imperfectly drained, the rivers having low banks, and during the winter and early spring being subject to overflow from the floods. The remainder of the State, saving a strip a few hundred feet wide along some of the larger streams, is absolutely free from this danger. The remainder of the State, to the east of this line, has only the variety which comes from the difference in the

wear of the streams in the rock. The nature of this difference will be discussed under the head of geology. It is only necessary to say here that the whole of the area described on the map as Cambrian is characterized by broad flat-topped ridges, with steep-banked rivers between; the general character being that of a much cut up table-land. The part marked as Devonian has broad valleys and steep-sided, tower-like hills. That marked Subcarboniferous, especially in the region west of the Cincinnati Southern Railway, is characterized by having all its smaller streams underground, usually only the rivers over fifty feet wide at low water having their paths open to the sky. All this region wants the small valleys which we are accustomed to see in any country, but in their place the surface is covered by broad, shallow, cup-like depressions or sink-holes, in the centre of which is a tube leading down to the caverns below. All this region is completely honey-combed by caverns one level below the other from the surface to the plane of the streams below. In one sense, this set of underground passages may be regarded as a continuous cavern as extensive as the ordinary branches of a stream when it flows upon the surface. The sink-holes answer to the smallest extremities of the branches. Some idea of the magnitude of these underground ways may be formed from the fact that the Mammoth Cave affords over two hundred miles of chambers large enough for the passage of man, while the county in which it occurs has over five hundred openings leading far into the earth, none being counted where it is not possible to penetrate beyond the light of day.

The Carboniferous formation is characterized by being cut into very numerous valleys, mostly rather narrow and with steep-sloped, narrow-topped ridges on either side. The relatively narrow valleys, and the general absence of any large areas of flat land on the top of the ridges, cause this region to have less land well fitted for cultivation than any other part of the State. Every part of the surface of the State not permanently under water may be regarded as fitted by its surface for the uses of men, not one thousandth of it being so precipitous as to be unfit for cultivation in some fashion. The writer knows

of no equal area in Europe that has as little waste on account of its contour.

RIVER SYSTEMS.

Reference has been made to the fact that the whole of this Commonwealth lies within the basin of the Mississippi, and over ninety per cent. of its area within the Ohio Valley, the remainder pouring its waters directly into the Mississippi. There are, however, a number of large streams which are the property of the State; and two, the greatest tributaries of the Ohio, gather a part of their waters in the State.

Big Sandy. — Beginning at the eastern end of the State, we have the Big Sandy or Chatterawah River, which separates for forty miles, by its main stem and then by its eastern fork, the State of Kentucky from West Virginia. This stream is the only river of its size in America all the basin of which is in the coal-bearing rocks. It drains a valley of about four thousand square miles. Its name of Sandy is derived from the very large amount of moving sand in the bed, coming from the rapid wear of the sand rocks which compose the beds of all its tributaries. The valley consists of a narrow belt of level, arable land bordering the streams, and a great extent of hill land of a good quality of soil, but only fit for permanent cultivation on the more gradual slopes. The greatest value of soil-products in this valley is to be found in its timber resources, which will be found specially mentioned under the head of timber. It may be said here that the valley contains, next to the Upper-Kentucky and the Cumberland Valleys, the largest amount of original forest found in any part of the State, and more than any other valley is especially fitted for the continued production of timber of varied quality. The forests throughout this region readily and rapidly reproduce themselves in the same species, after being cut away. The soil of this valley is very well fitted for the growth of fruits of all kinds. The season is rather later than that of the other river basins of the State, and the liability to frosts possibly rather less than in the central region. Owing to difficulties of transportation, fruits have been as yet but little grown for exportation.

The whole of the cereals are produced in the valley. The soil is usually of a light sandy nature, with generally enough clay to give it a fairly lasting quality. The principal disadvantage arises from the steepness of the slope of the hills.

Mineral Resources.— The coal resources of this valley are, in proportion to its total area, greater than any other in the State, scarcely an acre of its area but probably has some workable coal beneath it. These coals are mostly of the ordinary bituminous qualities; some cannel coal occurs therein of workable thickness. A full account of these coals, with illustrative sections, will be found in the general description of the eastern coal-field. Little effort has been made to find iron ores in this valley. The dense forests and the softness of the rocks prevent the occurrence of trustworthy surface indications. In the lower part of the valley very important ores have recently been discovered, of which the precise areas and character are yet to be determined. (See the reports of A. R. Crandall and N. S. Shaler for further details.)

The Little Sandy Valley.— The general character of this small valley is much the same as that of the Big Sandy. The river is altogether within the Carboniferous formation. The early utilization of the iron ores of this valley has led to a knowledge of its mineral resources superior to that yet obtained for any other equal area in the State. About thirty-five feet of workable coals are known in the several beds of the valley. (See p. 42.)

Tygert's Creek.— Here the coal resources are more deeply cut down by the stream, which in good part flows upon the Subcarboniferous Limestone. Though wanting some of the best coals, it has many of the best iron ores of the State. Some beautiful caverns are found along its banks in Carter County. The general surface is much as in the valleys before described. In its upper part, the Limestone rocks give occasional areas of more enduring soils than are furnished by the Sandstones of the country to the eastward. The timber and other soil products are much the same.

The stream is not navigable, but can easily be made so by locks and dams, giving continuous navigation for about forty miles along the meanders of the stream.

The streams from the mouth of Tygert's Creek to the mouth of the Licking or Nepemini are all quite small, and drain a region of limited mineral resources. Kinniconick Creek gives access to a region abounding in admirable Sandstone for building purposes, and to some iron ores of undetermined richness, but of considerable promise. It can be made navigable at small expense. The whole of this valley abounds in excellent oak timber.

The Licking. — This stream, the fourth in size of the rivers of the State, ranking next to the Big Sandy, passes over all the formations found in the State except the Tertiary. From its source to near the mouth of Blackwater Creek it runs on the Carboniferous rocks. As far as Duck Creek, it is still bordered by these beds containing excellent coals, both cannel and bituminous. On the Subcarboniferous Limestone, which crosses the river near Blackwater Creek, is an excellent iron ore. On Slate Creek, near Owingsville, is an admirable mass of ore, the richest of the State, having at places a depth of fifteen feet or more.

Triplett and Salt-Lick Creeks afford excellent building-stones, and the same series of rocks (the Waverly) furnish some stones which give great promise for lithographic purposes.

From the mouth of Fox Creek to the end of the river the stream is entirely in the lower Blue Limestone or Upper Cambrian rocks, which afford excellent building-stones, but no other marketable underground products.

The soil of the valley varies greatly, — light sandy loam in the Carboniferous and Waverly series; rather wet clays on the Black Shale and Silurian; rich, loamy clays giving soils of the first quality over the lower or Cambrian half of the stream.

The Blue Limestone lands of the counties drained by the North Fork are noted for their large yield of a tobacco highly prized by the manufacturers of "fine cut," and well known in the markets under the name of "Mason County tobacco."

The Kentucky. — Sixty miles below the Licking, the Kentucky discharges into the Ohio. This stream is the second of the Kentucky streams in volume, and the first in length.

Its head-waters, from Sturgeon Creek east, lie altogether with the coal-bearing rocks. At least four hundred miles of water-front, open to vessels able to carry three hundred tons of coal, can be made on the three forks of this river. The coal holds along the hill-sides as far as Station-Camp Creek. The upper half of the Red-River branch contains also an abundance of coal. The entire drainage of the Kentucky River, above its forks in Lee County, is in the Carboniferous rocks. No portion of the State exceeds the Upper Kentucky region in number, thickness, or quality of coals. A preliminary section, made by Mr. P. N. Moore, of the Kentucky Geological Survey, from Red River in Wolfe County to the mouth of Troublesome Creek in Breathitt County, establishes the fact that up to the latter point there are at least five workable coal-seams above the Conglomerate Sandstone. The following analyses, from carefully averaged samples, will show the excellent quality of these coals:—

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Specific Gravity	1.300	1.294	1.297	1.290	1.289
Moisture	2.50	3.50	3.56	2.76	2.10
Volatile Combustible Matter .	41.10	35.20	33.56	36.60	36.20
Fixed Carbon	49.22	56.70	58.38	56.50	58.20
Ash	7.18	4.60	4.50	4.06	3.50
Coke	56.40	61.30	62.88	60.56	61.70
Sulphur	0.818	1.189	1.381	0.865	0.836

No. 1 is a coal from Frozen Creek, Breathitt County.

No. 2 is a coal 5' 7" thick, from Devil Creek, Wolfe County.

No. 3 is a coal from Spencer's Bank, Breathitt County.

No. 4 is a coal 6' thick, from Wolfe Creek, Breathitt County.

No. 5, from near Hazard, Perry County.

Analyses by Dr. Robert Peter and Mr. Jno. H. Talbutt, chemists for the Kentucky Geological Survey.

The cannel coal of the Upper Kentucky is to be found over an extensive area, and is of a remarkably good quality, as will be seen from the following analyses by the chemists of the survey, made from average samples:—

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Specific Gravity	1.280	1.265	1.280	1.180	. . .
Moisture	0.94	1.30	3.40	1.20	1.20
Volatile Combustible Matter .	52.38	47.00	34.40	58.80	40.86
Fixed Carbon	35.54	44.40	46.96	35.30	46.44
Ash	11.14	7.30	6.24	4.70	9.50
Coke	46.68	51.70	53.20	40.00	57.94
Sulphur	1.423	1.574	0.630	not est.	0.634

No. 1. Georges' Branch Cannel Coal, Breathitt County.

No. 2. Haddock's Cannel Coal, mouth of Troublesome Creek, Breathitt County.

No. 3. Robert's Coal, Perry County.

No. 4. Frozen Creek, Breathitt County.

No. 5. Salt Creek, Perry County.

Three of the best gas-coals in Scotland and England are: (No. 1), Lesmahago Cannel; (No. 2), Ramsay's Newcastle Coal; (No. 3), Weym's Cannel Coal. Compare with the above the following analyses, taken from Dr. Peter's Report, Vol. II. First Series Kentucky Geological Survey:—

	No. 1.	No. 2.	No. 3.
Specific Gravity	1.228	1.29	1.1831
Volatile Matter	49.6	36.8	58.52
Fixed Carbon	41.3	56.6	25.28
Ash	9.1	6.6	14.25
	100.0	100.0	98.45

Sulphur not determined.

The indications are that the coal-measures thicken, and the number of workable coals increase south-easterly from the mouth of Troublesome Creek. This, however, can only be determined by detailed survey.

In addition to the numerous workable coals above the Con-

glomerate Sandstone in this region, there are two workable coals below the Conglomerate. The excellent quality of these coals can be seen from the analysis, No. 1601, p. 81.

Just below the coal the Carboniferous Limestone bears upon its top the ore known as the Red-River iron ore, which has long furnished a very celebrated cold-blast charcoal iron, well known as Red River car-wheel iron. There is probably about one hundred miles of outcrop of this ore within a short distance of the tributaries of the river, and within twenty miles of the main stream. Salt, fire-clay, and hydraulic cement abound in the Black Shale and Upper Silurian rocks. From Burning Creek to the mouth the Kentucky Valley runs entirely within the Upper Cambrian or Blue Limestone.

The soils in this valley have the same character as in the Licking, ranging from the light loamy soils of the Carboniferous, through the clays of the Silurian and Devonian to the exceedingly rich blue-grass soils of the Cambrian and Cincinnati Limestone rocks. The navigation of the Kentucky River has been improved by locks and dams as far up as a point about twenty-five miles above Frankfort. The stream is admirably adapted for the extension of this method of navigation, until over six hundred miles of navigable water is secured. As in the case of the Licking and the Green, it has the peculiar advantage of having a very great variety of soil and natural products within a narrow compass.

The timber resources of the part of this valley that lies within the coal-bearing area are very great; all the important timber trees of Kentucky, except the cypress, are found within the valley. The black walnut is found in abundance on the hill-sides throughout this section, the finer qualities of oak, much yellow pine, some white pine, &c.

Salt River. — This stream is the only considerable river in the State that has little in the way of mineral resources. It will be seen that it follows the line of the outcrop of the Subcarboniferous Limestone throughout its whole extension, being the only river in the State that does not run across the general trend of the stratification. The valley abounds in good Limestone for building purposes, the whole of the Subcarboniferous

Limestone being exposed along its banks. The underlying Sandstones of the Waverly also furnish excellent building materials. Iron ores occur in the Waverly Shales, and perhaps also in the Subcarboniferous. The salt-bearing rocks of the lower Waverly and the Black Shale are doubtless accessible from the line of the surface of the valley. The flow of water is rather more steady than in the other rivers to the eastward, on account of the cavernous nature of the rocks along its banks. It will, therefore, furnish excellent water-powers along its whole course.

The soil of this valley is of pretty even excellence throughout. The head-waters drain a region of Blue or Cambrian Limestone, and the main stream takes the soils of the Waverly which are rather sandy, and the Carboniferous Limestone which affords very good soil.

The river has a more than usually rapid fall, descending about six hundred feet in its course of about one hundred miles from the head-waters,—probably the most rapid fall of any stream of its size in Kentucky. This will make the improvement of the stream more difficult than of other rivers of the State.

The Green.— This, on many accounts the finest of the rivers that have their whole course within the State, differs in many striking regards from the other streams. It is at its lowest stage about one-third larger than the Kentucky. The Kentucky and Licking streams have their mineral belts at their head-waters, while the lower part of their course lies in districts having their greatest value in their agricultural resources. The Green, however, has its lower half within the western coal-field, and its upper waters in the older rocks. This western coal-field is described in another section of this pamphlet, to which the reader is referred for details. In a general way it may be said that it is exceeding rich in coals of varied quality, and abounds in iron ores of high grade. Muddy River, Bear Creek, and Nolin, are peculiarly rich in iron ores, the district between Bear Creek and Nolin being one of the richest in America in the ores of the Carboniferous period.

Soils.— The soils of this valley have throughout a high order

of merit when they lie on the Subcarboniferous Limestone. They are clay loams with a perfect underground cavern drainage, excellent for all grains and for fruits. The coal-bearing rocks give soils of a much higher quality than is usual in such formations, nearly the whole of the area occupied by these rocks giving good grain crops and tobacco of a high quality and of a large yield to the acre.

The whole of this valley is peculiarly fitted for furnishing water-power. Rough Creek, Pond River, Muddy River, Bear Creek, Nolin River, Big Barren River and its tributaries, and all the other streams heading in the Subcarboniferous or lower Limestone are singularly steady in their flow, owing to their underground reservoirs of water. To these underground sources they owe as well their comparative immunity from freezing, the Green rarely freezing in the winter season. The whole of this valley is singularly well fitted for fruit culture, on account of its immunity from winter killing and destructive spring frosts, and its neighborhood to Chicago, Cincinnati, Louisville, and other great markets.

Nearly the whole of this valley abounds in excellent timber, principally hard-wood. The upper waters have large quantities of valuable cedar timber; the Carboniferous district abounds with the several species of oak, great quantities of valuable hickories, walnut, tulip-tree (or poplar), some holly of large size, sometimes over fifteen inches in diameter. There is also a good deal of hemlock along the cliff borders of the streams, and some cypress in the lower swamps in the Pond River district.

Tradewater River. — This stream bears about the same relation to the western mineral field that the Little Sandy does to the eastern coal-field. Excepting a few of the less important head-waters, the whole of its basin lies within the coal-bearing rocks. Its soil is very fertile and well fitted for the growth of cereals and tobacco. An abundant growth of hard-wood timber of varied species compose its forests; for its area it is one of the richest fields for the oaks, hickory, poplar, that exists within the State.

The coals accessible in this valley are, in part, only above

the drainage level. They represent some of the best coals in the western district. Iron ores exist in abundance, but have never been worked.

The Cumberland. — This river has the upper half and lower sixth of its course within Kentucky. The upper region lies within the coal-field and traverses some of its richest sections. The part above Cumberland Ford is in a great mountain valley between Cumberland Mountain and Pine Mountain. This valley is about twelve miles wide, and is a fertile region abounding in excellent timber, with the land, so far as arable on account of its steepness, of excellent quality. About one-third of the surface is fit for culture with the plow. Below Cumberland Ford the river bottom widens, and the mountains sink down. The land along the river is very rich indeed, and that back on the hills is of good quality. At about two hundred miles from its source, the stream cuts down into the lower rocks, and from near the Kentucky line throughout most of its current in Tennessee runs on the Upper Cambrian or Blue Limestone formation; when it reënters Kentucky it is back to the rocks of the Subcarboniferous age, and the valley is an exceedingly fertile district. The line of this valley brings its southern edge near to the Tertiary formation of the western part of the State. Its proximity to the Tennessee on the west and to the Green on the east narrows the valley to small size; all the tributaries on the lower waters are small, but the upper confluent of this stream contain some of the finest rivers of the State. Martin's Fork, Clear Creek, Straight Creek, Rockcastle River, and Big South Fork are all considerable rivers, and afford excellent water-powers. They are all streams of great steadiness of flow, and all the conditions are favorable to the formation of valuable water-powers. They all traverse regions of very great resources in the way of iron and timber, and have soils of fair quality.

It is probable that no other valley in the West possesses so great a body of valuable timber as the Cumberland and its tributaries. Poplar, the several varieties of oak, beech, maple, sweet and sour gum, walnut, and other deciduous trees abound. Red cedar, yellow and white pine, are found in certain districts in considerable quantities.

The Cumberland is nearly equal to the Kentucky in the area and richness of its mineral districts. The coal section in the valley between Pine Mountain and the Cumberland Mountains has a depth of two thousand feet, and about twenty distinct beds of coal,* of which half-a-dozen are workable. The iron ores have not been examined or sought for. They may be expected to occur at several points in the coal-bearing rocks and on the top of the Subcarboniferous Limestone. The rich Clinton ores of the Cumberland-gap district,† though not in the drainage area of the Cumberland River, are in necessary commercial relations with it, inasmuch as they must be smelted by the charcoal and stone-coal of this valley. It is also most probable that these same ores are accessible along the hundred miles of the Pine-Mountain fault, by means of adits or galleries above the drainage, or by shafts of shallow depth. Detailed reports concerning this region may be expected in the fifth and eighth volumes of the Reports of the Survey. Beneath a large part of the upper Cumberland region the formation, commonly called the "Black" or "Devonian" Shale, is filled with a lubricating oil of great value. Experience has shown that these wells are practically inexhaustible, and that the oil is of a very superior quality, especially fitted for use in high latitudes, where other oils congeal. From one of these wells on Otter Creek, in Wayne County (see map), the oil is exported by wagon to Cumberland City, thence by rail to the river, thence by a precarious navigation to Nashville; even with these hindrances the business is

* Analysis of an average sample taken from a coal-bank forty-four inches thick, on Yellow Creek, Bell County : —

Specific gravity	1.282
Moisture	1.36
Volatile combustible matter	35.80
Fixed Carbon	59.54
Ash	3.30
Coke	62.84
Sulphur	0.975

† See Report of P. N. Moore, in fourth volume, and the Biennial Report of N. S. Shaler, third volume, in second series.

found to be profitable. With effective transportation a very large industry could be founded on this product; for, unlike the light burning oils, those heavy lubricating petroleums are of rare occurrence, and find a market that is scarce supplied by the present production.

This river is navigable for steamboats for a part of the year as far as the crossing of the Cincinnati Southern Railway. The great falls offer an obstacle to improvement of navigation into the upper waters, but not an insuperable barrier. Except this fall and the rapids immediately above it, the stream offers great facilities for improvement; it would be possible to make at least four hundred miles of slack-water navigation within the mineral belt on the upper waters of this stream.

The Tennessee. — This river debouches into the Ohio, within Kentucky, and has the last sixty miles of its magnificent course within the State. This part of the valley is among the lowest lands of the State; on the east side the river is bordered by the Subcarboniferous Limestone, rich in iron ores; on the other, it extends into the low Tertiary lands which reach to the Mississippi River. The land along this stream is very fertile.

The limitations of this brief sketch make it impossible to speak of many lesser streams of great economic importance, some of them capable of being made navigable by simple canalization. Nor has reference been made to the resources of the main Ohio. The mineral resources available in this valley are only in part derived from Kentucky, so they will not be discussed here. The alluvial soils within the valley of the Ohio are of a high order of fertility throughout its course. From the mouth of the Chatterawah, or Big Sandy, downwards to the mouth, the valley is distinctly bounded by cliffs, which gradually diminish from about six hundred feet to less than thirty feet near its mouth; no part of alluvial plains have any distinct swamp character until we come below the mouth of the Tennessee, though they, in part, are liable to winter overflows. This strip of arable land on either side of the stream widens from an average of about one-half of a mile near the Big Sandy to about one and a half miles near the mouth of the Tennessee. Its fertility becomes the greater the further it is removed to the west.

WATER-POWERS.

The very numerous rivers of the State supply a large number of water-powers of great value. Although the soils want the retentive power which belongs to regions where they were formed by the glacial period, and extensive lakes are wanting, owing to the absence of the action of the same agent in this region, yet the freedom from closure by ice, and the excellent character of the foundations for dams and mills, goes far to balance the advantages. It is impossible to consider these mill powers in detail. The following points may be noted:—

The main Ohio at the falls at Louisville offers a very great but unused water-power; the flow at the lowest stage of water exceeds that of any water-power used in this country. A very valuable power exists at Cumberland Falls, in Pulaski County, where a stream as large as the one named falls about sixty feet. This point is near the Cincinnati Southern Railroad. The various slack-water dams now building and to be built in the State all afford admirable water-powers where the power itself and the transportation of the manufactured products are both well assured. As a general rule, the other water-powers are best where the waters drain from the Subcarboniferous Limestone; next in order of merit when their supply is from rocks of the Waverly or Subcarboniferous Sandstones. Next in value are the streams in the Blue Limestones, or Upper Cambrian; and, least of all, the streams from the coal-bearing rocks, which are generally largely composed of dense Sandstones and impervious Shales, having little in the way of water-storage spaces. The deficiency in the storage of water in the soil can be easily remedied by use of storage reservoirs, which, from the depth of the upper valleys and the generally good foundations, can be readily made.

SOILS AND AGRICULTURE.

All the Kentucky soils except the strip of alluvial land along the banks of the rivers have been derived from the decay of the underlying rocks. They may be called soils of

immediate derivation, as distinguished from the soils made up of materials that have been borne from a distance by water, or which deserve the name of soils of remote derivation. This feature of immediate derivation gives the Kentucky soils a more local character dependent on position than those of any State north of the Ohio. In that region the intermingling of materials due to the last ice period has reduced the soils to a more nearly equal character. Beginning with the lowest rocks, the soils of the Blue or Cambrian Limestone are those of the first quality, and are surpassed by no soils in any country for fertility and endurance. These soils are derived from a Limestone very rich in organic remains, which decays with great rapidity, and continually furnishes its *débris* to the deeper-going roots. This soil varies considerably in different districts, and at some few points, where the underlying rocks are locally rather sandy, it falls from its usual high quality. The best soil may be known by the growth of blue ash, large black locust, and black walnut. Many other trees are found in its forests, but these are characteristic, and are never found together save on best soils.

The most advantageous crops on this soil are grass, it being a natural grass land, all the grain crops, and on the richer parts hemp. Fruits of all kinds belonging in this climate do quite well on this soil. The steep slopes along the valleys are well suited for grape culture. The peculiar features of the soil are its endurance under culture. This region having been the first settled in the State, the extraordinary capacity of this soil for withstanding bad methods of farming led to the general opinion that soils of less inexhaustible properties were not worthy of notice; hence the comparative neglect of the soils of the lower rocks, which, though generally fertile, can be wasted by careless agriculture far more easily than those of the blue-grass region.

The soils of the Silurian (commonly called Upper Silurian Limestone) are much less fertile than those of the underlying rocks. When not too cherty, they make good grain and grass lands. There is generally such a mixture of the decayed matter of the underlying and overlying rocks that this thin formation, which does not exceed about one hundred feet thick, gives

but little soil which can properly be called its own. As this formation ranges from forty to one hundred feet thick in the outcrop, there is only a small area, not exceeding eight hundred square miles, occupied by these soils.

The soils of the Black or Devonian Shale have even less importance than those of the formation last mentioned; not over four hundred miles of the area of the State is covered by them. When found, they are generally a tough clay which only needs drainage to have very valuable qualities.

The Waverly or Subcarboniferous Sandstone has a thickness of several hundred feet, and furnishes an area of about five thousand square miles. Its soils are generally light clay loams, becoming more sandy as we go towards the north-east. They are throughout excellent fruit-soils, and yield fair crops of all the grains.

Next higher in the geological succession we find the Subcarboniferous Limestone, or Cavern Limestone, as it is commonly called. This rock makes a larger area of soil than any other formation except the coal-measures and the Blue Limestone (Cambrian), and may slightly exceed the latter in area. These soils are generally excellent enduring soils, ranking next to the best of the Blue Limestone soils. They are excellent grain and fruit lands, and in the western region are well suited for tobacco. Their drainage is generally excellent, on account of the cavernous character of the Limestone beneath.

The soils of the Carboniferous belt occupy by far the largest single area in the State, covering not far from fourteen thousand miles of surface. The soils in it are exceedingly variable in character, but are generally a sandy loam. On the conglomerate or lowermost part of the coal-measures, the soils are usually the poorest,—about the only really infertile soils of the State being the small strips of the soils formed on this rock.

These strips are usually very narrow, and do not include altogether more than three hundred or four hundred square miles. The remainder of the Carboniferous area is composed of fairly fertile light lands, interspersed with areas of great fertility.

Some of the best lands of the State are upon the summits of the Carboniferous mountains of Eastern Kentucky; it is safe to say that, wherever the shape of the surface admits of cultivation, the Carboniferous rocks of Kentucky furnish fair soils adapted to a varied range of crops. The considerable part of its surface that is not fit for agriculture is admirably suited for the production of hard-wood timber of the most valuable varieties, and will doubtless have in this fitness a source of wealth scarcely less than tillage of the best lands could give.

As a whole, the surface of Kentucky includes a larger area of very fertile land and a less area of barren soil than any other equal area in a State so rich in mineral wealth. The prize of wealth hidden beneath the earth is generally bought by conditions that do not favor agriculture; but, despite the fact that Kentucky has resources of coal and iron that exceed those of Great Britain, she has scarcely a square mile of surface that cannot give a constant return from its soil.

The production of these soils includes the whole of the crops of the Mississippi Valley, except the sugar-cane. Indian corn, wheat, oats, rye, barley, buckwheat, flax, flourish over its whole surface. Sorghum, for making molasses and sugar, is grown over its whole area. The conditions favor the making of sugar from beet-roots. All the ordinary fruits attain their perfection here. Cotton is raised as a crop in the south-western region of the State. Tobacco is more extensively cultivated here than in any other State in the Union. The best natural grass lands of the continent are found in the Cambrian or Blue Limestone district. Hemp is extensively grown in the same area. The blooded horses of the State are perhaps the most famous of its exports. Its remarkable superiority in this regard is doubtless in part due to the care given thereto, but, in the opinion of the best judges, is in the main the result of the peculiarly favorable effects of a combination of conditions in which soil, climate, and water all have their place. Horned cattle and sheep also do well here.

Climate.— That this State is peculiarly well fitted for the European races is shown by the fact that in no region is there a greater degree of physical vigor than in the population

within its limits. The statistics of the United States Sanitary Commission distinctly show that this is the largest-bodied native population in this country or Europe, as in the table on the opposite page.

The climatic conditions, as far as they can be described here, are as follows: * The average temperature is about 50° Fahr. As in all America, the range of temperature throughout the year is considerable; it is, however, much less in Kentucky than in the States further to the north. It is rare to have the thermometer below the zero of Fahrenheit, and it never happens that it remains for twenty-four hours below that point. The summers, though warm, are less oppressive than along the lowlands near New York for instance, owing to the considerable elevation above the sea and the relative dryness of the air. The summer heats do not at all interfere with the labor of northern-born people in the open sun. There is much experience to show that in this respect the climate is not more trying than that of New York State. Open-air work is generally possible during the whole winter, the ground rarely being so frozen as to impede construction-work or even ploughing. Cattle are not generally fed more than three to four months, and are often left in the pasture for the whole winter.

The rainfall is about forty-five inches per annum along the Ohio River, increasing towards the south-east to about sixty inches at Cumberland Gap. This is distributed with fair regularity throughout the year, — the summer droughts not being sufficient at any time to destroy crops well planted on well ploughed ground, and rarely sufficient in any way to embarrass

* The following, compiled from the United States Census Reports for 1870, shows the healthfulness of Kentucky: —

In population, Kentucky ranked as the eighth State in the Union.

In percentage of deaths to population, Kentucky ranked as the twenty-eighth State; that is, there were twenty-seven States having a greater death rate than Kentucky.

Population, in 1870, 1,321,011. Deaths, from all causes, 14,345, — or 1.09 per cent. of the population. The health of the State has increased, since 1850, as follows: —

Death to population was, in 1850, 1.53 per cent.

" " " " 1860, 1.42 " "

" " " " 1870, 1.09 " "

TABLE OF MEASUREMENTS OF AMERICAN WHITE MEN,

COMPILED FROM REPORT OF THE SANITARY COMMISSION, MADE FROM MEASUREMENTS OF THE UNITED STATES VOLUNTEERS DURING THE CIVIL WAR. BY B. A. GOULD.

Mean Height by Natives.			Mean Weight by Natives.	Mean Circumference of Chest.		Mean Dimensions of Heads.	Proportional Number of Tall Men in each 100,000 of same Nativity.	Ratio of Weight to Stature.
Nativity.	No. of Men.	Height in inches.		Pounds.	Full Inspira- tion in inches.			
New England	152,370	67.834	139.39	36.71	34.11	22.02	295	2.075
New York, New Jersey, Pennsylvania	273,026	67.529	140.83	37.06	34.38	22.10	237	2.102
Ohio and Indiana	220,796	68.169	145.37	37.53	34.95	22.11	486	2.153
Michigan, Missouri, and Illinois	71,196	67.822	141.78	37.29	34.04	22.19	466	2.106
Seaboard Slave States			140.99	36.64	34.23	21.93	* 600	2.094
Kentucky and Tennessee	50,334	68.605	149.85	37.83	35.30	22.32	848	2.192
Free States West of Mississippi River	3,811	67.419		37.53	34.84	21.97	184	2.136
British Provinces, exclusive of Canada	6,320	67.510	143.59	37.13	34.81	22.13	237	2.126
Canada	31,098	67.086	141.35	37.14	34.35	22.11	177	2.114
England	30,037	66.741	137.61	36.91	34.30	22.16	103	2.056
Scotland	7,313	67.258	137.85	37.57	34.69	22.23	178	2.086
Ireland	83,128	66.951	139.18	37.54	35.27		84	2.096
Germany	89,021	66.660	140.37	37.20	34.74	22.09	106	2.123
Scandinavia	6,782	67.337	148.14	38.39	35.37	22.37	221	2.158

* Slave States not including Kentucky and Tennessee.

* Slave States not including Kentucky and Tennessee.

agriculture. The number of days of sunshine is relatively very large, considering the amount of rainfall.

MEAN TEMPERATURE.													
	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	Annual Mean.
1870-71.	•	•	•	•	•	•	•	•	•	•	•	•	•
Louisville. .	59.08	46.4	33.4	36.7	39.5	50.7	59.1	64.	75.	77.2	79.	66.7	57.3
1871-72.													
Louisville. .	60.5	44.0	38.0	30.8	36.0	38.7	59.1	67.6	74.3	79.0	78.2	69.8	56.3
1872-73.													
Lexington .	• • • •	38.2	27.9	30.4	35.6	40.9	53.1	64.7	73.7	76.5	73.7	66.8	• • • •
Louisville. .	56.6	39.5	29.4	31.1	36.8	43.3	54.6	67.	78.	79.	78.	69.5	55.23
1873-74.													
Lexington .	53.8	40.7	39.6	36.5	39.8	44.3	46.9	63.6	77.9	77.8	75.1	70.9	55.5
Louisville. .	54.	41.5	38.7	37.5	39.5	45.6	48.8	68.2	80.7	80.7	79.3	72.2	57.2
RAIN-FALL. — Inches.													
1870-71.													
Louisville. .	3.89	2.40	2.20	3.05	5.74	7.29	20.6	5.97	3.86	2.22	3.06	1.23	42.95
1871-72.													
Louisville. .	1.85	2.51	3.29	(*)	(*)	1.41	8.40	4.49	6.19	3.67	2.45	4.41	38.67†
1872-73.													
Lexington .	• • • •	1.21	3.53	2.53	4.05	3.73	2.88	6.05	4.54	3.37	2.94	1.60	• • • •
Louisville. .	3.92	0.56	2.58	2.93	5.42	3.39	3.05	5.73	3.87	3.43	3.04	2.56	40.42
1873-74.													
Lexington .	5.47	2.09	4.41	5.41	4.89	5.90	6.81	0.79	3.55	6.26	1.57	2.89	50.04
Louisville. .	3.26	2.19	6.99	2.39	5.18	6.63	6.01	1.17	2.95	2.71	3.23	0.62	43.33
Average Annual Mean for thirty years, 55.9°. Rain-fall, 50.30 inches.													
* Rain-Gauge not in position.													
† Ten Months.													

The healthfulness of this region is not exceeded by any State in this country. Epidemic diseases have never been destructive outside of some of the towns. The experience of the city of Lexington has shown that even in the towns such diseases are curable by the use of pure drinking-water. Miasmatic diseases are not known on the table-lands, being limited to the low regions near the large rivers; at least seven-eighths of the State enjoy an absolute immunity from such diseases. Consumption is rare, compared with the northern and eastern States. Yellow fever never occurs. This region is remarkable for the number of persons in extreme old age, who retain their faculties quite unimpaired and a large share of bodily vigor. The writer, who has made this subject of longevity a

matter of much inquiry, is satisfied that the region from the Big Sandy to the Cumberland, especially the higher parts of the table-land, and where Limestone soil is found, is peculiarly fitted by its conditions to retain the vigor of the body to an extreme old age, deserving, in this regard, to rank with the Canton de Vaud in Switzerland and the few other favored spots where longevity is a characteristic of the people. He is also satisfied that the proportion of bodily deformities and diseases of imperfect development,—such as curvature of the spine, rickets, &c.,—is smaller within this area than among any equally large native population in this country or in Europe. Of the whole population of whites and blacks, about eleven hundred thousand of the former and three hundred thousand of the latter have been on the soil for three generations (these numbers are approximate). It needs only inspection to show that there has been no degeneration during this time, and that the world-wide reputation for vigor which the State has acquired is not likely to be lessened in the time to come.

Natural Beauties of Scenery.—In all those features of natural beauty which go to lend attractiveness to a fertile region, this State is much favored. Above any other State it is rich in rivers, and these have an incomparable variety of loveliness. Their head-waters lie around the stately mountains of the Cumberland range, their middle distances course through gorges often cut into deep cañons, and their lower waters verge gently into the great valleys of the Ohio and Mississippi. The valley of the Upper Cumberland lies in a broad mountain trough, affording some of the finest scenery of the whole Appalachian chain. Big South Fork of the Cumberland, Rockcastle River, Red River, of the Kentucky the whole of the Upper Kentucky, Tygert's Creek, the upper part of the Big Sandy, — all present that mingling of clear stream, steep cliff, and beautiful vegetation, which is the great charm of a mountain country. The cañon of the Kentucky, between Frankfort and Boonesburg, is perhaps the most charming scenery of its kind in the region east of the Mississippi. The deep gorges of Green River and its tributaries, Nolin and Barren

Rivers, abound in exquisite scenery; cliffs, in the semblance of castles, towering hundreds of feet above the streams, their faces pierced by caverns, and hung with a foliage of almost tropical luxuriance.

The cultivated district of Central Kentucky, commonly known as the Blue-grass District, is perhaps for its area the most beautiful rural district in America. The surface is undulating; large areas of the original forests have been cleared of their undergrowth and produce a fine close sod, and in these wood-pastures are some of the finest flocks and herds in the world. It has happened to the writer to pass on several occasions from this region to the richest lands of Middle England, or *vice versa*, and he has always been struck by the singular likeness of the two countries. There is probably a closer resemblance between the surface of the country, the cattle, horses, the agriculture, and even the people of these two areas than any two equally remote regions in the world.

The western part of the State abounds in natural beauties; the rich forests and the noble rivers, the Mississippi, Ohio, Tennessee, Cumberland, and the Green, give it a most attractive surface. Even the deep swamps of the lowest regions have a sombre charm that deserves the attention of the tourist. No region ever visited by the writer exceeds in weird beauty the environs of Reel Foot Lake, where the great earthquakes of 1811-13 formed a lake some fifty miles in area. All over its surface stand the trunks of the cypresses that grew in the swamp before the convulsion. These are now reduced to tall columns blackened and whitened by decay. The surface of the lake is a mass of water-plants, in summer a perfect carpet of flowers; *Nymphæas*, a half-foot or over, and the *Nelumbium*, water-chenquepin, or American lotus, a golden flower often exceeding a foot in diameter, cover its surface with their blossoms and fill the air with their perfume.

Caverns. — The subterranean beauties of the State are already famous. The Mammoth Cave is, however, only a noble specimen of a vast series of caverns, to be numbered by the tens of hundreds, that occupy nearly all of the Subcarboniferous Limestone area of the State. This cavern-belt extends

in a great semicircle from Carter County, where there are several beautiful caves and two remarkable natural bridges, to the Ohio below Louisville. These caverns have as yet been but little explored, and their beauties are mostly undiscovered. There are probably many thousand miles of these cavern-ways accessible to man. The Indian tribes knew them better than our own race; for it is rarely that we find any part of their area which does not show some evidence of the presence of ancient peoples.

MARKETS AND TRANSPORTATION.

As regards proximity to markets, this State has peculiar advantages, which only await the completion of transportation routes already begun to render its position unequalled among American States. Reference to a map will show that it is the most centrally placed in the group of States east of the Rocky Mountains. From the geographical centre of Kentucky it is about an equal distance to Central Maine, Southern Florida, Southern Texas, and Northern Minnesota. The State of Colorado, the Great Lakes, and the mouth of the Mississippi fall in the sweep of the same line.

The river system of the Mississippi has its centre within the borders of Kentucky, and her lands are penetrated by more navigable rivers than any other State in the Union. Her territory includes about fifteen hundred miles of streams that are navigable at all stages of water, and about four thousand miles of other streams that can be made navigable by locks and dams. These streams give access to the whole Mississippi system of inland navigation, which includes about twenty-five thousand miles of streams now navigable, or readily rendered so by the usual methods of river improvement. The State has at present connection by water transportation with at least twenty millions of people, occupying an area that will probably contain near two hundred millions within a century from this date. There is a proposition now under discussion to use the convict labor of the State on the improvement of the rivers, which if carried to success is likely to make their complete canalization an accomplished fact within twenty-five years.

The existing railways of the State form a system which wants but a few connecting links to give it an admirable relation to the rest of this country. The north and south lines consist of the following roads, beginning on the east: The Eastern Kentucky, from Riverton in Greenup County to Willard in Carter County; thirty-five miles of road built to develop the coal and iron district of this section, with the expectation of eventual continuation to Pound Gap, and connecting with the south-eastern system. The Maysville and Lexington Railway, running south as far as Lexington, and connecting there with the system of roads about to be described. Third in the series on the west we have the Kentucky Central Railway, now extending to Lexington along the banks of the Main Licking Valley and its South Fork. The continuation of this road, by either Pound Gap or Cumberland Gap, to the railway system of Eastern Tennessee and the valley of Virginia, is likely to be accomplished at an early day. The Cincinnati Southern Railway, from the mouth of the Licking directly south to Chattanooga, will be completed during the present year, and afford an admirably built road traversing the State on its longest south and north line, and crossing the Blue-grass lands on their longest and best section. This road is likely to be of incalculable value to the State, forming as it does a main line to the South and South-east.

The Lexington and Big Sandy Railway is completed, as far as Mount Sterling in Montgomery County. This road when finished will give Kentucky cheaper and more direct communication, by way of the Chesapeake and Ohio Railroad, with the Atlantic ports. The Mount Sterling coal-road, now almost completed, extends from the latter place to the border of the eastern coal-field, in Menifee County. The extension of this road will greatly facilitate the development of the coal and iron region through which it is proposed to continue it.

The Kentucky and Great Eastern Railway is a proposed road on which considerable work has been done; extending up the south bank of the Ohio River from Newport, Kentucky,

to the Big Sandy River. The completion of this road will add greatly to the wealth of river line of counties, and will give the State a shorter road to the Atlantic ports than she now has.

The Louisville, Frankfort, and Lexington Railroad extends through the Counties of Jefferson, Oldham, Shelby, Franklin, and Fayette. From Lagrange in Oldham County a branch extends from this road to Cincinnati, known as the Louisville and Cincinnati short line,—that line, passing through the counties of Oldham, Henry, Grant, Carroll, Gallatin, Boone, and Kenton.

The Cumberland and Ohio Railroad, narrow-guage, now building, when completed, will pass through the counties of Henry, Shelby, Spencer, Nelson, Washington, Marion, Taylor, Green, Metcalf, Barren, and Allen. Its length in Kentucky will be 165 miles.

The Louisville and Nashville Railroad extends, with its branches, a distance of 356.4 miles through Kentucky in different directions. The Main Stem, from Louisville to Nashville, has a length within the limits of the State of 139.6 miles, running through the counties of Jefferson, Bullitt, Nelson, Hardin, Larue, Hart, Edmonson, Barren, Warren, and Simpson. The Memphis Branch runs through the counties of Warren, Logan, and Todd, having a length in the State of 46 miles. The Lebanon Branch extends into South-eastern Kentucky, running through the counties of Nelson, Marion, Boyle, Lincoln, and Rockcastle; it has a completed length within the State of 109.9 miles, and its extension to the State line is projected, and its completion only a matter of time; it will then connect with a road leading to Knoxville in the State of Tennessee. The Richmond Branch runs through the counties of Lincoln, Garrard, and Madison for 33.4 miles, to within a short distance of the rich iron region of Kentucky. The Bardstown Branch runs through the county of Nelson, a distance of 17.3 miles. The Glasgow Branch, 10.2 miles long, runs to Glasgow, the county-seat of Barren County. The Louisville and Nashville Railroad is undeniably one of the most important thoroughfares of this continent; it is second only to the Mississippi River as a way for the com-

merce between the Northern and Southern States. By means of the magnificent railway bridge over the Ohio River at Louisville it connects with all the great northern roads, and at Nashville and Memphis, its southern termini, it connects with all the important roads of the South.

The Louisville, Paducah, and South-western Railroad extends from Louisville to Paducah, a flourishing city situated on the banks of the Ohio River, fifty miles from its junction with the Mississippi, and is the principal market-town of Western Kentucky. This railroad penetrates Western Kentucky in such a manner, therefore, as to afford easy access to a large portion of that section. It runs through the counties of Hardin, Grayson, Ohio, Muhlenberg, Hopkins, Caldwell, Lyons, Livingstone, Marshall, and McCracken. It passes directly through that section of the valuable coal-fields of Western Kentucky which lies within the area of the counties of Ohio, Muhlenberg, Hopkins, and Grayson. The entire length of the Louisville, Paducah, and South-western Railroad is 225 miles, all of which is within the territory of Kentucky.

The Paducah and Memphis Railroad runs through the counties of McCracken and Graves, connecting at Memphis all of the south-western railroads.

The Owensboro, Russellville, and Nashville Railroad is completed from Owensboro, on the Ohio River, to Owensboro Junction on the Louisville, Paducah, and South-western Railroad, passing through the counties of Daviess, McLean, and Muhlenburg.

The Evansville, Henderson, and Nashville Railroad, from Henderson on the Ohio River to Nashville, Tenn., passes through the counties of Henderson, Webster, Hopkins, Christian, and Todd. At Henderson a ferry takes cars to the northern system of roads. It forms the most important link in a great trunk line known as the St. Louis and South-eastern Railway. The New Orleans, St. Louis, and Cairo Railroad passes through the counties of Ballard and Hickman. The Mobile and Ohio Railroad, connecting the city of Mobile on the Gulf of Mexico with the Ohio River, penetrates Kentucky through the counties of Hickman and Fulton.

At Columbus, in Hickman County, a ferry fitted for the carriage of trains gives passage to cars from St. Louis directly through to the south-eastern cities. Of the ten before described north and south railways, four have northern connections; two (the Cumberland and Ohio and the Cincinnati Southern), now under construction, will have southern connections. The others all look to the same end, but have not yet succeeded in accomplishing it.

It is in roads with eastern connections that the State lacks most. There is not yet a single railway crossing the eastern line of the State. It is to this difficulty of access from the seaward that the State owes the small share it has had in the immigration of capital and labor that has filled the lands of less attractive regions. Three routes have been begun, which, when complete, will fully remedy this grave defect; namely, a road from Louisville to the south-east *via* Cumberland Gap, completed to Livingston, and requiring a continuation of about one hundred miles to connect with roads leading from Morristown, Tenn., to Charleston, S. C.; a road from Mount Sterling to Abingdon, Va., *via* Pound Gap, requiring about one hundred and sixty miles of road to complete the connection; a road from Lexington to connect with the Chesapeake and Ohio, requiring about eighty miles to bring it to completion. The northernmost and southernmost of these roads are likely to be carried forward to completion within a few years. There is a project for building up, east and west, a road along the northern range of counties of the State, giving a continuous route from Henderson, and the roads connecting at that point, to the connections with Charleston and Savannah from Morristown, Tenn.; also a project for a road from Chicago to Charleston, crossing Kentucky from Gallatin County to Cumberland Gap.

It will be seen from this brief sketch that the railway system of Kentucky is on the whole good, and wants but little to make it, as a system of trunk lines, exceedingly well adapted to the development of her resources. Taken in connection with the river system, it is clear that, within a generation, we may expect here a transportation system excelled by no State on the continent.

With reference to markets, it will be seen, by consulting the census tables, that the State has at present access to a larger number of markets than any other Western State: although there is but one large city within her limits, the cities of Cincinnati, St. Louis, Nashville, and Indianapolis lie upon her borders. Her principal export products have a special value that makes them sought on her own soil by purchasers enough to take any product that can be furnished; on the borders of the State, a host of manufacturing towns are rising that will certainly make a market for all the food, fuel, and raw products from her soil, quarries, and mines.

PRICE OF LANDS.

In no other State having any thing like the same advantages can lands be bought at so low a price. The best agricultural lands, or those commanding the highest price, are found in the Limestone regions and along the principal rivers; these, when cleared and not worn, bring from thirty to one hundred dollars per acre. The same, uncleared, will be about half these rates. The second-rate lands in the same regions bring from ten to forty dollars per acre. The lands on the coal-bearing beds, though often exceedingly fertile, are generally very cheap. When contiguous to transportation they may generally be estimated at about ten dollars per acre, but the tracts of good tobacco lands, with excellent timbering and great mineral resources, can often be purchased for two to four dollars per acre in tracts suitable for ordinary farming, within ready access of permanent transportation. Vast tracts of timber land, suitable for grazing, with much excellent land in the *coves*, or other level places, can be bought for from fifty cents to one dollar and a half per acre.

As a general thing, it may be said that the lands in this State are much cheaper than in any State north of the Ohio River. This is owing to the fact that, destitute of eastern communication, the State has hitherto had but a small share of the tide of immigration of capital and labor that has poured past her borders to fill the favored fields of the far West.

Nearly all the products of Kentucky have their prices

determined by the cost of transportation to the great centres of population along the Atlantic seaboard or beyond the sea. Its tobacco, pork, grain, and some of the costlier native woods, and some other products find their principal markets in Europe; cattle, and to a certain extent the other agricultural products of the State, have their values determined by the cost of transportation to the American Atlantic markets. Hitherto, this access to the domestic and foreign markets of the Atlantic shores has been had by way of the railway systems which traverse the region north of Kentucky, and from which the State has been divided by opposing interests and the physical barrier of the Ohio River. All the development of the State has taken place under these disadvantages. A comparison of the tables of cost given below will show that the complete opening of the mouth of the Mississippi to ocean ships will result in the enfranchisement of the productions of Kentucky in an extraordinary way.* At the present time, the freight-rates from the lower Ohio to Liverpool would permit the profitable shipment of the cannel coal

* "The following are taken from published freight-rates, and give time and cost of transit from St. Paul's, two thousand miles above New Orleans, to Liverpool by the two routes:—

	Cost per bushel. Cents.	Time. Days.
From St. Paul's to Chicago	18	4
Lake from Chicago to Buffalo	8	6]
Canal from Buffalo to New York	14	24
New York to Liverpool	16	12
Elevator or trans-shipment charges, Chicago	2	2
" " Buffalo	2	2
" " New York	4	2
Total	64	52

	Cost per bushel. Cents.	Time. Days.
From St. Paul's to New Orleans (<i>via river</i>)	18	10
New Orleans to Liverpool	20	20
Elevator charges, New Orleans	2	1
Total	40	31

Here is a saving by direct trade of twenty-four cents per bushel, or eight shillings per quarter, and a saving of twenty-one days in time. To be fair, I have taken the extreme point: *but the nearer the grain is to the Gulf, the cheaper the transportation.*"

and native woods of many different species to Europe with one trans-shipment at New Orleans. It is impossible, on account of limited space, to give a detailed statement on this point; but evidence can be furnished to those desiring it. It is to be noticed that it is possible for several months each year to bring ships of large draught of water to the loading points on the Ohio River, and load them for direct trade with Europe. The tonnage of such vessels both ways from New Orleans would be at the lowest rates for such work current in any region. It will be seen that the State of Kentucky has the most extensive shore on the navigable waters of the Mississippi Valley, and that even in the present incomplete development of her navigation system she will have over fifteen hundred miles of frontage on continuously navigable waters. There can be no doubt that the market expenses of the products of the State will be reduced nearly one-half when the far-reaching consequences of the development of water-transportation are attained. It will not be amiss to notice that the costs of transportation by water, far lower than by rail in most countries, is peculiarly cheap on the Mississippi and its principal tributaries; coal is lower than in any other country, as is also timber for boat-building; there are no tolls on the streams, and the currents are generally slow near the shores, admitting of tolerably easy ascent.

FITNESS FOR INVESTMENTS OF CAPITAL AND LABOR.

For all the important branches of agriculture and manufacture, so far as they depend on cheap and fertile soils, good climate, and a great abundance and low price of coal, iron, and hard-wood timber, and last, but not least, low taxation, — Kentucky offers unsurpassed advantages for the creation of industries. It will be impossible to name these opportunities in detail, but some of the most important may be suggested. The growing industries of the Ohio-River Valley and the neighboring regions offer continued opportunities for the increase in the export of the raw products of the State. Coal, iron, salt, timber, cements, building-stones, can all be produced at great profits, even in the present depressed state of the industries of the

world. The Ohio Valley probably gains in population at an average rate of not less than five per cent. per annum. This great elasticity of demand insures a successful result in any discreet industrial venture. Besides the coal and iron mines, the attention of capitalists is requested to the production of other articles of equally steady demand. Salt can be produced over a large area at the cheapest possible rate,—the water hardly requiring pumping from the shallow wells, and the gas furnishing fuel. The great amount of fire-clays should be considered. The tile-clays are admirable in quantity and quality. An area of several thousand square miles in the State is rich in marls, containing large quantities of potash and soda, fitted for the production of fertilizers. The western section of the State is admirably fitted for ship-building; excellent ship-timber can be had cheaper than in any other country, and there is ample water to take ships drawing twenty feet to the sea for half the year. Besides the enormous possibilities of business derived from the working of raw products, finding their market in the great and growing States of the Mississippi Valley, there are most important opportunities derived from its relation to the regions beyond the sea. The natural outlet to the Atlantic ports for these products is by way of the Mississippi to the sea. The freights from Western Kentucky to New Orleans are less than one-half of the rate from the same region directly to New York. Until the success of the Eades-Jetty project, this method of carriage to the sea was practically impossible. At present it is practicable to load timber-ships and colliers at the ports from the western coal-field, and send them directly to the Atlantic ports, or to any markets beyond the sea. Already a large trade in wine-cask staves exists between this region and Europe. These staves pass through six hands before coming to the consumer. These exchanges could be readily reduced to three by direct shipment. The demand seems to be practically inexhaustible, and the timber exists in very great quantities. To this industry there could be readily added a business in the manufacture and shipment of spokes, felloes, and other carriage-parts, the parts of railway-carriages, agricultural implements, &c. Building-stones of admirable quality

exist all along the tributaries of the Ohio, and their export to the Atlantic ports is already a considerable commerce.

As will be seen from the accompanying map, the State of Kentucky lies, as a region of peculiar mineral resources, in the centre of the region now holding, and destined always to hold, the mass of American population. The present centre of population is adjacent to the northern border of Kentucky, and it is practically certain that in centuries to come it must remain within or on the borders of Kentucky. This makes it sure that manufactures will from this region always command the widest markets with the least carriage.

The advantages of this district to the agriculturist are known by the cheap land, good climate, and abundant variety of crops. These crops are near to a great and growing set of markets. Among the new ventures in agriculture must be placed fruit-culture for the northern markets, — a business that is now taking a very important place in the industries of the State. The poorer lands of the southern part of the State have a peculiar fitness for this purpose.

The following table, compiled from the United States census report, proves that Kentucky is susceptible of a greater variety of production than any other State. It will be observed that it is in each census the first State in the production of some one or more staple articles: —

	1840.	1850.	1860.	1870.
Wheat	First.	Ninth.	Ninth.	Eighth.
Swine	Second.	Second.	Fourth.	Fifth.
Mules		Second.	Second.	Third.
Indian Corn	Second.	First.		Sixth.
Tobacco	Second.	Second.	Second.	First.*
Flax	Third.	First.	Third.	Eighth.
Rye	Fourth.		Fifth.	Fifth.
Hemp		First.	First.	First.
Cotton	Eleventh.			Twelfth.
Value of Home Manufactures	Third.		Second.	Third.

* In 1870 Kentucky produced near one-half of all the tobacco produced in the United States, and more than half of all the Hemp. The production of Tobacco increased from 105,305,869 pounds in 1870, to 158,184,929 pounds in 1873.

The high rank of Kentucky as an agricultural State can best be appreciated when it is remembered that more than one-

half of the State is in forest, and that the State is only exceeded in area of woodland by three States. Yet, with less than half the land in cultivation, the State ranks eighth in the value of agricultural products.

Building and other Economic Stones.— The building-stones of this State are limited to Limestones and Sandstones. Within these limits, however, there is a most abundant variety of color, hardness, and other qualities. The Limestones of the Upper Cambrian, or so-called Lower Silurian, are excellent stones of exceedingly varied qualities. Usually they afford a gray marble of admirable resisting powers against wear, especially fitted for buildings when their courses of rocks are suitable. Along the Kentucky River this series of rocks affords a beautiful buff and cream-colored marble, admirably fitted for detailed sculpture work, the Clay Monument at Lexington being made of this stone. This stone can be quarried on the banks of the river in any quantity and at small expense, and transported by boat to the Ohio River. Next above this level we have the equivalent of a part of the cliff-limestone of Ohio, which has received the local name of Cumberland Sandstone in the Kentucky reports. This Sandstone is thin, and passes into a cherty Limestone in the northern part of the State; but in the basin of the Cumberland it is of a peculiar greenish color, affording a very handsome and durable building-stone, resembling in many regards the Buena Vista Sandstone of Ohio. This stone will doubtless have considerable value in the time to come, as it is peculiar in its color among all the building-stones of the Ohio Valley. No other good building-stones occur until, after passing above the Black Shale, we come to the beds of Sandstone of the Waverly period. The beds of this section afford the only Sandstones of the State that have been extensively worked for building purposes. These beds, commonly known as Buena Vista stone, are the only source of the Sandstones used in Cincinnati and Louisville, and in most of the other western cities. At present they are worked along the Ohio and south-east of Mount Sterling in Montgomery County; but they can be had where the Licking, Kentucky, Salt, and Green Rivers cross the Waverly, and at the points where the railroads of the State pass over the same formation.

It is, however, in the Subcarboniferous or Mountain Limestone that the greatest variety and area of economic stones occur. Here we have Limestones (carbonates) which are the finest known in this country; Oölites which, for beauty of grain and endurance of time and other forms of wear, are unsurpassed; Dolomites that have all the fine qualities belonging to those Magnesian Limestones; and, finally, a series of more or less Argillaceous Limestones, some of which are already in use as lithographic stones, and promise good results. These Oölites have been in use for forty years in the town of Bowling Green, and retain all their tool-marks as when dressed, having hardened very much since their working. Stones for furnace-hearths abound throughout the whole mineral district. Some millstones have been worked for local purposes, but have had no extensive test. Grindstones are made from the Waverly Sandstone, which is admirably fitted for this use. Some good grindstones have been made from the Carboniferous Sandstones of Western Kentucky.

GOVERNMENT, POPULATION, TAXES, EDUCATION, FUTURE.

The government of Kentucky is at present modelled in part on that of New York, and in part on that of Virginia,—the legal framework being essentially that of the former State. The legislative machinery differs somewhat from that of the other States, in that the senate is re-elected one-half each two years, while the lower house is simply renewed each two years by election. There is no actual State debt,—the school-fund debt being such only in appearance, in fact only an obligation to pay a certain sum for the support of schools. No State debt can constitutionally be contracted, and during the last ten years, while other States have been steadily increasing their obligations, Kentucky has paid off the debt which was left by the war, and now is debtless, and with considerable assets. The last legislature (1876) reduced the taxes by one-eighth, after a careful inquiry going to show that it could be done with safety. The following statement summarizes the condition of the State in 1875:—

"It will thus be seen, that in the last two years we have redeemed and paid off \$347,000 of the public debt, and there now only remains of bonds outstanding and unredeemed \$184,394. The residue of these bonds are not due and redeemable until 1894-5-6."

To meet this indebtedness we had, on the 10th of October, 1875, the end of the fiscal year,*—

To the credit of the Sinking Fund	\$153,559.07
230 United States 5-20 gold-bearing interest bonds, worth not less than 20 per cent. premium . . .	246,000.00
Making	\$399,559.07

The whole traditions of the State are strongly in favor of economy and honesty in every branch of public affairs. No loss by defalcation has ever occurred to the State. Debts cannot be incurred by counties, cities, or towns without special authority from the legislature. This permission is now given only in rather rare cases, and is subject to great limitations from the organic law. The result of these conditions is an immunity from the danger of destructive taxation, such as does not exist in any other State in this country.

Education.—The State now gives from the general treasury the sum of one million dollars to the purpose of common school education; this is, *per capita*, as large a contribution from the general fund as is given in any State; as yet, this has been inadequately supplemented by local aid, but much progress is now making towards the creation of graded schools in every village where the population admits of it. The laws allow the imposition of a considerable local tax for schools. There is no State with an equally scattered population where so much has been done for the elementary education.

Universities and colleges do not now receive the aid of the State. There are, however, a number of excellent institutions of this grade in the State. The first collegiate institution west of the Alleghanies was Transylvania University, at Lexington. Kentucky University, Georgetown College, Centre College, and a number of other similar schools of newer date, many of

* In a report made by the State Treasurer, January, 1876, the State debt was shown to have been much less than the above, and the surplus in the Treasury had increased to near one million of dollars. This report will appear in next edition of this pamphlet.

them excellent in their methods, and provided with considerable endowments, furnish the higher education of the State.

The charitable institutions, nominally so called, are sufficiently furnished by the State. A very high place is held by the asylums for the deaf and dumb and for the feeble-minded, in both of which recognized advances have been made in the methods of dealing with these forms of human infirmity.

It remains to speak of the most important element in the State, its population.* Probably no other State in this Union contains a people as purely English in descent as this. At this date (1876) the population numbers 1,600,000; of these only 200,000 are of African descent, or about one-eighth of the total. There is a steady decrease in the black population, and an equally steady increase of the white, so that the negro now makes but an inconsiderable fraction of the State; by far the greater part of the blacks are gathered about the towns in light labor of the domestic class. The relations between the two races are those of entire harmony. Separate schools are founded for the two races.

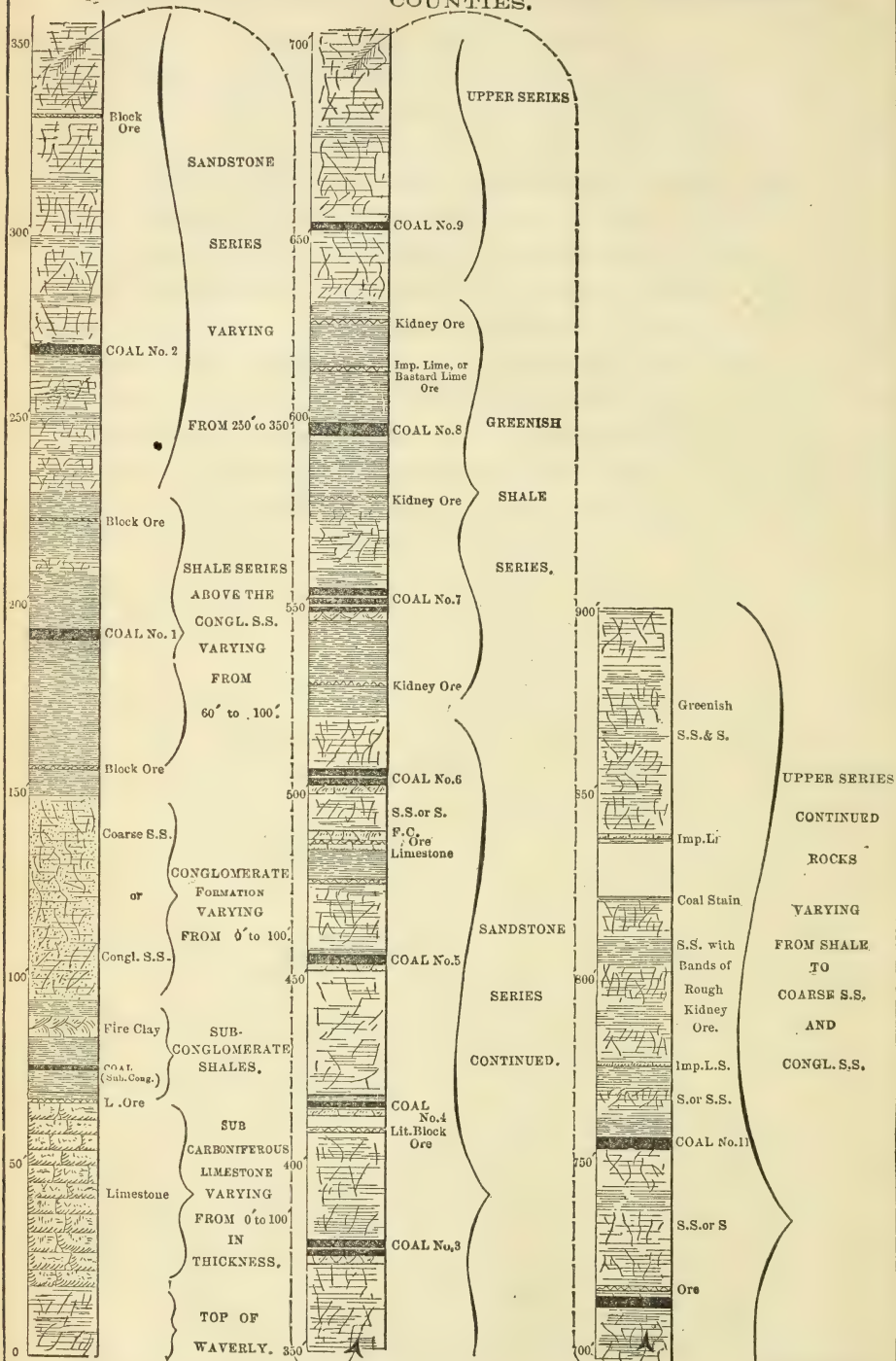
In 1870, the foreign-born population in Kentucky amounted to 63,398 (is probably at the present time less than 100,000); of these 31,767 were Germans, and the remainder from various other European countries. The greater part of this foreign population is settled along the Ohio River, but it exists in almost every county. The honest and self-supporting citizen of every country has always received a warm welcome in Kentucky; no jealousy has ever shown itself towards the foreigner. The government of the State has for years always had a number of conspicuous members from beyond the sea; one of the United States senators and several of the members of the legislature are also from other countries.

Without indulgence in excessive claims, which would be quite foreign to the sober tone of this Commonwealth, we may reasonably expect for Kentucky, in the time to come, a substantial growth proportioned to her natural advantages. As at the present moment, when the country generally is under

* In 1790, Kentucky was the fourteenth State in population, having a population of 73,677. In 1870, Kentucky was the eighth State in population, having 1,321,011

a heavy burden, the result of its commercial extravagances, the State of Kentucky is actually prosperous in a fair degree, so we may expect in the future a consistent and conservative progress that will not be attended by those periods of commercial depression that so generally accompany a growth of an excessive kind. The unequalled blessings of the Ohio Valley, its wealth of mineral stores, fertility of soil, goodness of climate, and facilities for transportation, are all shared in large measure by Kentucky. Another century will doubtless see this Valley the greatest seat of those productions that require cheap power and cheap food for their making, bringing a population equal to that of the equal areas in the great European States; when this comes, this Commonwealth will contain within her borders probably not less than eight millions of people, and sources of wealth and power unsurpassed on this continent.

Plate No. I.
GENERAL SECTION
FOR
GREENUP, BOYD, CARTER, & Part of LAWRENCE
COUNTIES.



BRIEF STATEMENT OF THE ECONOMIC GEOLOGY OF THE BIG-SANDY VALLEY.

THE valley of the Chatterawah or Big-Sandy River is entirely within the limit of the coal-measures, and, with perhaps one or two exceptions, where the Subcarboniferous Limestone is brought to the surface, the rocks exposed on the waters of the Big Sandy are those of the coal-measures proper.

The number of distinct beds of coal known to be present in this valley is twelve. Iron ores are found at about an equal number of levels. The accompanying general section, from report of A. R. Crandall on the geology of Greenup, Carter, Boyd, and Lawrence Counties, shows the order of the beds, both of coal and of iron ore, near the Ohio River. Further southward changes occur in the general character of the rocks above coal No. 3, so changing the general section as to render any identification of beds from the little that is now known of them quite untrustworthy. Fuller investigation will doubtless discover most of the coals as found near the Ohio, and the thickening of beds as found southward gives promise of richer fields than those already developed.

The following table shows the thickness of the beds that have been fully identified as seen in the localities where mined:—

Coal, No.	Minimum.		Maximum.	
	3 ft.	0 in.	5 ft.	0 in.
1.	3	0	5	0
2.	2	0	3	8
3.	2	6	6	6
4.	2	0	4	6
5.	3	6	9	0*
6.	3	0	4	0
7.	3	0	6	0
8.	2	6	8	0
9.	2	0	2	6
10.			3	6
11.	2	0	2	6
12.				†

* Coal 5 is generally slaty in part where found in great thickness.
† Not opened.

The following table of analyses of samples, taken from the whole thickness of beds as mined, will serve to indicate the character of the beds included, and of the coals of this field generally:—

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.	No. 8.
	Graham Bank.	Kibby's Bank.	Peach Orchard.	Cannel Hunnewell.	Buena Vista.	Keye's Creek.	Coalton.	Head of Nat's Cr'k.
Specific Gravity . .	1.267	1.289	1.317	1.306	1.360	1.279	1.320	1.367
Moisture	2.50	4.10	3.26	1.50	3.20	2.94	5.00	3.50
Volatile Com. Mat.	36.00	34.60	34.22	52.20	32.30	32.50	34.50	31.90
Fixed Carbon . .	57.30	55.25	55.36	40.60	53.00	56.76	55.40	52.06
Ash	2.90	4.77	7.16	5.70	11.50	7.74	5.10	12.50
Sulphur	1.148	1.414	0.901	0.782	1.999	1.972	1.285	0.873

Coal No. 8, as represented in this table, is from the head of Nat's Creek, in the north-eastern corner of Johnson County, where it is fully eight feet in thickness, with slight partings. The only average sample from this locality was necessarily taken from near the outcrop, giving too large a percentage of ash, and probably too small a percentage of sulphur.

The thickness of the measures, which include the coals of this table, is about four hundred feet in the regions best known. Coal No. 1 is exposed along the Big Sandy, southward from Peach Orchard and Warfield, at a level which is in general slightly above high-water mark. The hills along the river and the main creeks rise to the height of six and seven hundred feet, including the equivalents of the accompanying general section from coal No. 1 upward. What beds are present in these hills is yet to be ascertained.

GENERAL RESOURCES

OF THE

WESTERN COAL-FIELD AND BORDERING TERRITORY.

I.

SUBCARBONIFEROUS BEDS.

THE coal-field is bordered by Subcarboniferous beds, which are, in succession, those forming the Chester group, and those included in the St. Louis group.

The Chester series are rich in stores of potash-marls, while the St. Louis group yields a number of beds of very admirable building-material.

It is also in the region underlaid by the Subcarboniferous beds that the excellent Limonite iron-ore, so highly esteemed by iron-manufacturers, is found.

As the group is of especial interest, the following typical section of the Chester group, as it occurs on the eastern outskirts of the coal-field, is given: * —

No. 1.	Shale, with thin beds of Limestone	15 feet.
2.	Heavy-bedded, cherty Limestone	13 "
3.	Red and green Shale	5 "
4.	Rhomboidally-jointed Sandstone, frequently charged with Brachiopoda	0 to 10 "
5.	Limestone	2 "
6.	Shale	10 "
7.	Limestone and Shale	20 "
8.	Green, red, purple, and blue, marly Shales ; the Leitchfield marls	25 to 60 "
9.	Shale and thin-bedded Limestone	5 "
10.	Shaley Sandstone	0 to 20 "
11.	Heavy-bedded, dark-gray, and blue Limestone	15 to 45 "
12.	Massive Sandstone ; the "big-clifty" Sandstone, ...	60 to 130 "

* Described in detail in Part VI., Vol. I., Second Series Kentucky Geological Reports. N. S. Shaler, Director.

This section is frequently modified. The economic values of the different beds are dependent, in a measure, on their persistency. Space forbids any detailed discussion of the question here. It may be remarked, however, that none of the beds are found to be trustworthy over large areas, unless it be the marls. The persistency of the marls, however, as *individual* beds, is not a settled question. The strata are exceedingly variable in their lithological features, and lateral changes are very frequent, both in their composition and thickness. It is not uncommon for Limestone or Sandstone-beds to be, either in whole or in part, replaced by Shales. Hence beds occurring at some certain locality that would, from their color and composition, be referred to the horizon of the Leitchfield marls, may really belong at a lower or higher level, having replaced some more solid bed. This, however, does not militate against the fact that the Leitchfield marls proper extend over a great area.

The St. Louis group is distinctly separated by the physical characters of its strata into two divisions. The upper or gray Limestone division is formed of a series of gray and drab beds, among which are included two well-marked varieties. One variety, a white Oölite, is quite characteristic of the division. Usually associated with the Oölite are beds of dense drab to cream-colored stone, which breaks with a smooth, conchoidal fracture, and resembles lithographic stone.

The upper division furnishes some of the best building-stones and materials for lime that are to be found in the State. The lower division includes beds of dark-blue to bluish-gray Limestone. The rock is frequently fetid from carbonaceous matter, such as bitumen, held in it, and nests of massive calcite and fluor spar are not infrequent in it. The study of this group is especially interesting on account of its being the repository of the lead deposits of Western Kentucky.

* A section of the beds forming the group, and other matters concerning it, will be found in Part VI., Vol. I., Second Series Kentucky Geological Reports. N. S. Shaler, Director.

II.

THE COAL-FIELD.

IN studying the resources of the area occupied by the Carboniferous beds in Western Kentucky, the greatest interest naturally belongs to that section underlaid by the coal-measures.

In form the coal-field is somewhat basin-like; that is, the beds incline from the margins towards the centre. The border of the field has never been completely traced with accuracy; but its course may be approximately delineated as follows: * —

Commencing at the Ohio River, in Crittenden County, it follows up the valley of the Tradewater River into Caldwell County; thence crossing into Christian County at a point about five or six miles above Tradewater station (on the Louisville, Paducah, and South-western Railroad), it keeps in a south of easterly course towards the head-waters of the Pond River. From a point about two and a half or three miles south of Petersburg, Christian County, the southern boundary makes a south-eastwardly curve, passing by the head-waters of the Pond River to the Muddy River, which stream it crosses somewhere near its forks. Thence it passes through the southern part of Butler County, crossing Barren River below the mouth of Gasper River, thence eastwardly along the divide between those rivers, crossing Green River above the mouth of Nolin River, and extending north-eastward to the head-waters of Casey Creek in Hart County. Thence it curves to the north-west, crossing Nolin River near the mouth of Dog Creek; passing a point between Millwood and Leitchfield in Grayson County, — an outlier or tongue extending north-eastwardly, on the north side of Nolin River to the

* These outlines have been mainly obtained from Vol. I. Kentucky Geological Reports, First Series; D. D. Owen, Director. They are quite imperfect, so far as regards details, but are sufficiently accurate for present general purposes. The faithful delineation of the outline of the coal-field has been made part of the work of the present survey.

head-waters of Hunting Fork, of Rock Creek,—and thence on to the Ohio River, to a point not far below Cloverport in Breckenridge County.

In the space thus included lie the whole of nine counties, and parts of five more, making an approximate total of nearly four thousand square miles for the area of the coal-field.

The Number of Coal-beds, &c.—Twelve coal-beds have been identified in the space between the Conglomerate (the base of the coal-measures) and the summit of the series.

It is believed as not improbable, however, for reasons unnecessary to discuss here, that, when sufficient data have been gathered to warrant a generalization concerning the number of beds, it will be found expedient to designate a less number of coals in the general section for the coal-field. For the present, therefore, a letter is used to designate each bed.

The results of the work of the Survey, so far, point to eight as the number of beds that may prove sufficiently trustworthy to receive final numbers. The total thickness of the coal-measures is as yet only approximately known. The thickness is variable, as is the number of coal-beds, and is greater at some localities than at others. It does not seem probable, however, that it will anywhere exceed one thousand (1,000) feet, and there are districts in which it is less than eight hundred (800) feet.

On the map of Kentucky will be found a section showing the position and number of these coals as determined by Dr. Owen's Survey, as well as some modifications made by the present Survey.

The thickness indicated for each bed, and the included space, are strictly in accordance with Dr. Owen's statement.

1. Anvil Rock Sandstone	20	feet.
2. Coal, No. 12 (Coal A)	3	"
3. Space	21	"
4. Coal, No. 11 (Coal B)	5	"
5. Space	46	"
6. Coal No. 10 (Coal C)	3	"
7. Space	68	"
8. Coal No. 9 (Coal D)	5	"
9. Space	50	"

10. Coal No. 8 (Coal E)	2½ feet.
11. Space	43 "
12. Coal No. 7 (Coal F?)	2 "
13. Space	84 "
14. Coal No. 6 (Coal G?)	3 "
15. Space	65 "
16. Coal No. 5 (Coal H?)	4 "
17. Space	95 "
18. Coal No. 4 (Coal I)	4 "
19. Space	154 "
20. Coal No. 3 (Coal J)	2½ "
21. Space	71 "
22. Coal No. 2 (Coal K?)	No thickness given.
23. Space	82 "
24. Coal No. 1 B (Coal L)	5 "

The preliminary arrangement adopted in the present survey differs in some particulars from the foregoing. In some instances the distances between the coals are increased, and in others diminished; and several of the beds are represented at a greater or smaller thickness than they are in Dr. Owen's Section.

The irregular distribution of the coal necessitated the separation of that part of the coal-field thus far examined into three divisions. The first extends from the eastern border of the field to the Green River; the second is approximately bounded by the Green and Pond Rivers; and the third extends from the Pond River to the western margin of the field.*

In the first division are found coals A, B, C, D, E, H, K, and L; proving eight of the twelve beds to be present.

In the second division are found coals A, B, C, D, E, F, G, and H; the number here also being eight. This, however, does not represent all of the coals that may be found, as the base of the coal-measures was not reached; it represents only those coals that come to the surface, or that have been reached in pits; no doubt, most of the lower beds are present.

* The region in question is that which is traversed by the Louisville, Paducah, and South-western railroad: none of the country bordering the Ohio River is included; nor yet that lying near the southern margin of the field. None of that region has yet been sufficiently studied to report on the number of beds. See Part VI. Vol. I., Second Series Kentucky Geological Reports, page 374.

In the third division most of the coals are found, the absent ones probably being C, F, G, and K (?).

Generalizing from the results obtained in each of these divisions, it is found that the average distances between the coals from A to H inclusive, in the region examined, are about as follows:—

1. Coal A	5	feet.
2. Space	5	"
3. Coal B	6	"
4. Space	15	"
5. Coal C Nothing to	2	"
6. Space	75	"
7. Coal D	5	"
8. Space	75	"
9. Coal E	1½	"
10. Space	20	"
11. Coal F	1½	"
12. Space	50	"
13. Coal G	½	"
14. Space	100	"
15. Coal H	4½	"

From coal H to coal L the spaces between the beds are very variable, and sufficient data have not been obtained to warrant the making of an average. As an instance of the changes, it may be mentioned that the distance from coal I to coal J varies from fifty to eighty-three feet.

Were all of the coals united in one bed, the deposit would be about thirty-five feet thick. As far as our examinations now show, coals K, G, F, E, and C may prove to be only local beds.

Quality of the Coals.—As a consequence of the very imperfect knowledge hitherto had concerning the coals of this field, the percentage of sulphur in the coals of Western Kentucky has been rated by many not only as inordinately high, but greater than in the coals of neighboring regions. This has been an error. It is true that in some of the beds the percentage of sulphur is large; but as a class the coals will compare favorably with those in any section of the Western coal-field. The matter of sampling coals for a representative analysis has not always received the attention that should be given it; what may be termed "hand" or

picked specimens have in the largest number of cases been used for analysis, and analyses made under such conditions cannot be fairly compared with ours, that were in every case made from samples *mechanically* taken and faithfully averaged.

It has been known for some years that the coals of the Western coal-field carry, as a class, more sulphur than do those in the Appalachian field; and less than do those in the Missouri and Iowa coal-field. It is not, therefore, with the coals of the States in the Appalachian coal-field that the Western Kentucky beds are to be compared as a class, but with those in the West; and when such comparison is impartially made, the Kentucky coals, as a class, are not excelled by those in other sections of the Western coal-field.

In Indiana and Illinois there are certain beds that have won a high reputation, a better one indeed than has hitherto been accorded the Kentucky coals; but later investigations have developed the fact that here, too, are exceptionally good beds, unexcelled, perhaps, by the most famous of those States. They have hitherto escaped general notice, from the fact that they do not lie in what has been the district of active mining operations, although within convenient reach of transportation facilities. Following are averaged analyses of those beds which so far have been deemed the most important:—*

	Number of Coal.						
	A.	B.	D.	J.	L.*	L?†	?‡
Moisture	3.43	3.27	3.37	3.70	4.85	3.30	1.30
Volatile Comb. Mat.	39.26	38.80	36.66	32.56	32.22	36.00	59.60
Fixed Carbon . .	50.23	51.23	51.97	50.04	55.03	57.88	27.00
Ash	7.08	6.70	8.00	13.70	7.90	2.82	12.10
	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Sulphur	2.753	2.548	2.806	3.716	1.373	1.024	1.896
Specific Gravity .	1.383	1.309	1.354	1.398	1.319	1.241	1.213

* From the Coaltown Banks, Christian County.
 † From near Wrightsburg, McLean County.
 ‡ The "Breckenridge" Cannel Coal, from near Cloverport, Breckenridge County.

* Some of the beds as yet insufficiently studied for judgment to be passed on them may prove fully as important, so far as regards quality, as those now wrought.

For comparison with the analyses of coal L, the following analyses of the Indiana "block" coal, and the "Big Muddy" coal of Illinois are given. These coals are considered to be among the best in the Western coal-field:—

	Number of Analysis.			
	No. 1.	No. 2.	No. 3.	No. 4.
Moisture	2.70	2.68	2.62	3.44
Volatile Combustible Matter .	36.38	36.32	32.04	31.86
Fixed Carbon	55.64	53.58	58.58	59.54
Ash	5.28	7.42	6.76	5.16
Sulphur	1.664	1.802	2.472	1.376
Specific Gravity	1.313	not est.	1.310	1.310

Numbers 1 and 2 are analyses of the Indiana "block" coal; numbers 3 and 4, of the "Big Muddy" coal of Illinois.

The analyses were made in the laboratory of the Kentucky Geological Survey of carefully averaged samples collected in the same manner that the Kentucky coals are sampled.* Special attention is directed to the analyses of the Coaltown and Wrightsburg coals. These are what are known as "blocking" coals, and withstand weathering remarkably well.

The Wrightsburg coal is remarkably good, containing less than three per cent. of ash, a small proportion of water, and but little more than one per cent. of sulphur. There is reason to hope that the Wrightsburg and Coaltown coal may prove serviceable as an iron-making fuel.

The Breckenridge Cannel is already well known for its remarkable properties.

Coal D seems to be the most trustworthy of all of the beds, and is the one most generally wrought throughout the coal-field. It is most useful as a household fuel.

Coal B is usually divided about the middle by a clay parting. The upper sixteen inches serves admirably for gas-making; several analyses show it to contain very little sulphur, and a large proportion of volatile combustible matters. At some points the coal yields an admirable coke.

* See page 177 of the Chemical Report of the Kentucky Geological Survey; Vol. I. Second Series. N. S. Shaler, Director.

III.

WATER-WAYS AND RAILWAYS.

THE coal-field is crossed by three railroads, and is so drained by several streams that, were they all prepared for navigation (a work of no very serious difficulty), no part of it would suffer for means of transportation.

All of the streams drain towards the Ohio River, which offers cheap transportation to the sea.

The streams that have already been made navigable for part of their extent are the Green, the Tennessee, and the Cumberland Rivers; those streams whose partial improvement is both feasible and desirable are the Tradewater and Pond Rivers, Rough Creek, Nolin River, Muddy River, and Bear Creek.

The Green River and its tributaries is navigable by locks and dams for two hundred and sixty-eight miles. The Tennessee is navigable from its mouth to Florence, Alabama, a distance of about two hundred and fifty miles; and the Cumberland River is navigable from its mouth to a point about one hundred miles above Nashville.

Regular lines of steamers ply on these rivers. Large shipments of coal are sent south by the Tennessee River.

The Pond River flows into the Green River, and during high stages of water is navigable for about fifteen miles; it may be rendered navigable by a system of locks and dams, as far up as Bakersport, a distance of about thirty miles.

The Tradewater River is ascended by light-draught boats during the spring freshets as far up as Belleville; it is quite practicable for it to be rendered navigable for forty miles, or more.

Prior to the building of the Louisville, Paducah, and Southwestern Railroad, Rough Creek (which empties into Green River), was regularly plied by light-draught steamers as far up as Hartford, Ohio County, having been rendered navigable by locks and dams. It will be seen that it is a mere question

of enterprise whether or not the streams may be used as roads for carrying out produce, &c.

The railways are the St. Louis and South-eastern Railway (connecting St. Louis, Mo., and Nashville, Tenn.), which passes north and south through Henderson, Webster, Hopkins, and Christian Counties; the Evansville, Owensboro', and Nashville railroad (not yet completed), which (so far as built) passes north and south through Daviess and McLean Counties into Muhlenburg County; and the Louisville, Paducah, and South-western railroad which passes westwardly through Grayson, Ohio, Muhlenburg, Hopkins, and Caldwell Counties intersecting the north and south running railroads; one at Owensboro' Junction, and the other at Nortonville.

The total number of miles of railroads in the coal-field is about one hundred and eighty-five.

Thus it will be seen that transportation is, or can easily be, furnished to nearly all of the workable coal-beds. The Green, Pond, and Tradewater Rivers and their tributaries (some of them of considerable size), and Rough Creek drain a large portion of the coal-field; while other portions are reached by the several railroads. Some of the best coals are found on the Green and Tradewater Rivers; but as yet comparatively little mining has been done in them.

So far nearly all of the important mines have been opened along the paths of the railroads, a plan which has resulted in giving them a more rapid, although more costly, transportation than was offered by the rivers.

IV.

NUMBER OF COAL MINES, &c.

IN all there are about thirty collieries of importance in the coal-field.

The mines are worked on a general plan modelled on the post and stall-system. About fifteen of them are located along the Louisville, Paducah, and South-western Railroad; six along the St. Louis and South-eastern Railway; and two

on the Evansville, Owensboro', and Nashville Railroad. Others are located in the neighborhood of Owensboro', bordering the Ohio River; at Airdrie on the Green River; and several in Crittenden and Union Counties, in the vicinity of Caseyville.

The Coal Trade.—It is difficult to determine the precise amount of coal raised in this field, as the records are very imperfect. The product of the Kentucky collieries, however, has operated greatly in regulating the amount of foreign coal brought into the State and into the Southern markets.

Louisville, of the home markets, has especially been benefitted by these mines, as the following will show:—

In the winter of 1871-72, on account of low water, the Pittsburgh coal reached the price of \$7.00 per load of twenty-five bushels, while the Kentucky coal sold at \$5.00 and \$5.50 per load.* In the succeeding winter (1872-73), the Ohio River was again at a low stage; but the highest price paid for Pittsburgh coal was \$5.00, the average being \$4.50; the Kentucky article selling at \$4.50 and \$4.00 per load. In the winter of 1873-74, there was a good stage of water in the Ohio River, and at the same time plenty of Kentucky coal, and the Pittsburgh coal sold at \$3.50 and \$4.00 per load. In 1874-75, there was a still greater reduction in prices, the Pennsylvania coal selling at \$3.00, and that from Kentucky at \$2.75 per load.

This season, the Kentucky collieries have suffered in common with those of other regions, and also from internal complications; hence their product may fall behind that of former seasons, or at most not go beyond it.

According to the census reports of 1870, when few collieries were in operation in this field, the production of the mines amounted to about 115,094 tons of coal; of which 67,466 tons were raised in Union County, and 23,600 tons in Crittenden County.

The product of the mines on the Louisville, Paducah, and South-western Railroad alone, from October 1872 to October 1874, amounted to 270,000 tons,† and at least half as much

* A ton of coal contains about twenty-five bushels.

† A number of the largest collieries were not in operation until 1873, hence for some of them the statement does not represent a business of two years. Scarcely any of the mines had been opened longer than two years when the statistics were obtained.

more may be estimated for the product of the other mines for that time, placing the probable product at 405,000 tons.

V.

BUILDING MATERIALS.

Wood.—The larger portion of the region west of Salt River, especially that lying within the limits of the coal-field, is supplied with forests of valuable timber.

In different sections of the region bordering the Green River fine white oak, chestnut, oak, yellow poplar, and black-walnut trees are found. In Daviess, and some other Counties, large-sized chestnut trees are not infrequent. The forests of Hopkins County and neighboring regions are noted for their growth of large-sized oaks and poplars.

Stone.—The St. Louis group furnishes admirable building-stone and material for lime. Some important quarries have been opened in its beds. At Bowling Green the Oölite is quarried very extensively, and the exportation of the stone in dressed blocks has grown into an important industry. At Glasgow Junction, in Barren County, the "lithographic" beds have also been largely quarried and dressing-works erected.

The Oölite and "lithographic" stone are both very valuable as building material, being unexcelled, perhaps, for nice work by any of the Subcarboniferous beds. The Oölite is especially esteemed by builders for its durability and beautiful appearance after dressing. Large quantities of it are sent to St. Louis and other western cities and to the south, and even to the Atlantic States. The dark blue beds of the St. Louis group, and a few of the Chester group, serve very well for heavy work.

Few of the Sandstones in the coal-measures are of much value as building material. They are, as a class, too soft and incoherent; hence liable to disintegrate when set in a wall. They are occasionally found suitable for ordinary purposes. The great sand-rock at the base of the Chester group is in a number of places a fairly good building stone.

Gravel Beds.—Between the Cumberland and Tennessee Rivers are large deposits of gravel, the shipment of which to cities in which gravelled streets are used may prove a source of profit. The gravel covers a considerable area, and in many places seems to have formed into ridges. The beds seem to be practically almost inexhaustible, and may be accounted among the valuable deposits stored in Western Kentucky.

The material is largely used on the streets of Paducah, and has also been tried in Louisville.

Paint Materials.—It is possible that some of the red earths found associated with the St. Louis beds may prove useful as materials for paint; their merit, however, is as yet only conjectural.

The Chester group, however, furnishes deposits of undoubted value for paint material. Southwardly from Leitchfield, Grayson County, beds are found of two colors, — red and light blue. The material has been locally used, and with very favorable results. The Shales overlying Coal A frequently furnish an abundance of ochre.

VI.

OTHER MATERIALS.

Marl Beds.—One of the most interesting results of the geological survey was the discovery of potash and soda in some of the marls of the Chester group, in such quantities as to prove them valuable as fertilizers.

Attention was first directed to the deposits near Leitchfield, Grayson County, and now they are searched for with interest wherever the Chester group is known to occur. They have been found in Grayson, Edmonson, Breckenridge, Caldwell (?), Christian (?), and Livingston Counties. Their entire extent is unknown, but it is not improbable that further explorations may prove their existence wherever the Chester group is fully developed.

Scarcely too high an estimate can be placed on these marls in Kentucky, as we have therein a ready and cheap fertilizer

for tobacco lands, — the properties of the marl being to renew the vigor of the soil as it is impoverished by the tobacco. The infertility of much of the land is largely due, not to original poorness, but to the exhaustion produced by tobacco; these potash marls are expected to serve in placing the lands once more in a fertile condition.

Following, is the analysis of a sample of the marl collected from Haycraft's Lick, Grayson County: —

Composition, dried at 212° Fahrenheit: —

Alumina, iron, &c., oxides	27.811
Lime carbonate	.880
Magnesia	.824
Phosphoric acid	.109
Potash	5.554
Soda	.657
Water and loss	4.245
Silica and insoluble silicates	59.920
	100.000

Lead. — In nearly all of the regions where the St. Louis group is fully developed more or less lead has been found. The only mining that has been done for the metal, however, has been in Livingston, Crittenden, and Caldwell Counties. In Livingston and Crittenden Counties a number of pits and excavations of various sorts have been dug for the purpose of working the deposits; with possibly one exception, however, the work has so far proven unprofitable. In Crittenden County considerable lead has been found at a point known as the Columbia mines, leading to the supposition that, economically managed, they may be wrought at a small profit. So far these lead-mines have had to contend with the production from the mines in the Rocky Mountains, where a large quantity of this metal has been produced, almost without cost, in the reduction of ores for their silver. Should this competition be in time removed, they would become more important sources of profit.

Zinc. — Zinc is frequently found in the form of the sulphide (Black-Jack) accompanying the lead; it has never been found in sufficient quantities for working.

Iron Ore.—As hitherto mentioned, some of the regions underlaid by the Subcarboniferous beds furnish admirable Limonite ore.

Towards the base of the coal-measures the Shales frequently carry good beds of the Carbonate ore; in general, however, the beds of the coal-measures are unproductive, save near their base, where some of the best ores of the Ohio Valley are found.

Fluor Spar.—Fluor spar is found in more or less quantities throughout the lead region. In Crittenden County, northwardly from the Columbia mines, fluor spar is found in great abundance. Considerable deposits of the massive variety, very white and apparently free from impurities, are found at the Memphis mines and vicinity. It is not unlikely that other important deposits may be found.

Mineral Springs.—Springs of sulphur and chalybeate water are not uncommon in regions where the Subcarboniferous series come to the surface.

The ones most frequented are the Grayson and Rough Creek Springs in Grayson County, the Ohio Springs in Ohio County, and the Sebree Springs in Webster County.

The Grayson and Rough Creek Springs are watering-places of considerable popularity in Kentucky and the South; the Grayson Springs being, perhaps, the most generally known. There are a number of other springs resorted to, and whose waters are esteemed by many; they have, however, more of a local reputation. The Sebree Springs have many visitors from the western part of the State and contiguous regions during the summer.*

The coal-measures also furnish mineral waters in some regions. The most interesting are in Daviess County, and are known as Hickman's Springs. Several of the waters are remarkable for the amount of alum they contain.

* Analyses of the waters from the various springs will be found in the Chemical Report, Vol. I., Second Series, Kentucky Geological Reports.

VII.

GENERAL REMARKS ON AGRICULTURE.

Soil.—There are three general varieties of soil found in the region of the Carboniferous rocks.

The soil of the coal-measures, originating as it does from Sandstones and Shales, is a light, sandy mixture, usually yellowish in color; or a rather dense, dark-colored material becoming waxy and unmanageable after rains, — according to localities. The soil resulting from the beds of the coal-measures seems especially adapted for the growth of tobacco. This may be due to the fact that nearly all of the Sandstones are micaceous, and that upon disintegration the mica furnishes the mixture with the potash required by the plant.

In the Chester group we get a mingling of sandy, calcareous, and aluminous materials, producing in some regions a fairly good soil. In general, however, Shale predominates largely, and produces, when unmingled with other materials, a poor and stubborn soil.

The finest soil for general purposes is furnished, perhaps, by the St. Louis group. It is a deep-red earth, rich in iron and other desirable matters. This soil is very characteristic of the St. Louis group, and is almost invariably found where the limestones are the first beds below the surface.

Crops.—Tobacco is the staple agricultural product of Western Kentucky; the other crops, such as wheat, oats, corn, and hay, are raised more for home consumption than as an article for exportation.

The following are the yields per acre of the several products, so far as past observation would indicate:—

	Lowest Yield.	Highest Yield.	Average Yield.
Corn *	10	60	30
Wheat *	8	35	10
Hay, (Timothy) †	1½	2	1½
„ (Red Top) †	1	2	1½
Tobacco ‡	300	1500	800
* Yield in Bushels. † Yield in Tons. ‡ Yield in Pounds.			

In her tobacco yield, Kentucky now stands first among the States, and the western part of the State furnishes by far the larger portion.

The principal tobacco-growing counties east of the Tennessee River are Caldwell, Christian, Daviess, Henderson, Hardin, Hopkins, Muhlenburg, and Ohio; Daviess County is said to be the largest producer, Christian County standing second.

The principal shipping points are Henderson, Owensboro', and Hopkinsville; Princeton and Eddyville are also depots for the handling of tobacco, — the former place doing a considerable business.

Owensboro', it is said, is the largest "strip" market in the world; Henderson falls but little behind it, and was until within the last year or two the largest market.

The time has been too limited wherein to obtain complete statistics of the trade at the different shipping points; the following statements, however, of the market at Owensboro' and Hopkinsville for a period of years will serve to show the magnitude of the tobacco interest.

The statistics concerning the Owensboro' market were kindly furnished by Captain R. L. Triplett.

Statement of the Amount of Tobacco exported from Daviess County for six years previous to 1876.

	From Owensboro'.	From other Points.	Hhds.	Pounds.
Product of 1868	5,000	500	5,500	8,250,000
" " 1869	5,500	500	6,000	9,000,000
" " 1870	6,500	500	7,000	10,500,000
" " 1871	6,000	500	6,500	9,750,000
" " 1872	7,500	500	8,000	12,000,000
" " 1873	9,000	500	9,500	14,250,000
" " 1874 *	3,000	500 †	3,500	5,250,000
" " 1875 ‡	8,000	500	8,500	12,750,000

* A short crop year.
† Not quite that much, but a fair enough estimate.
‡ Product not yet gone forward, but will reach as much.

Statistics concerning the Hopkinsville market are taken from the Annual Circular of Messrs. J. K. Gaut & Son:—

In 1870, there were sold 2,468 hogsheads.

" 1871,	"	"	"	5,970	"
" 1872,	"	"	"	6,711	"
" 1873,	"	"	"	9,155	"
" 1874,	"	"	"	13,047	"

These sales are up to Nov. 1 of each year, and include all the sorts of tobacco that are sent from the place.

Statistics of the Henderson market have failed to come to hand.

It must be borne in mind that Louisville and Paducah also receive large amounts of tobacco from this region ; * hence the foregoing show but a small proportion of the yield.

The following Table, extracted from a late circular from Liverpool, may be of interest, as it shows the number of hogsheads of Virginia and Kentucky tobacco on hand, March 1, for a series of years : —

VIRGINIA.	Leaf.	Strips.	KENTUCKY.	Leaf.	Strips.
1872	2,402	1,820	1872	8,436	9,754
1873	2,372	1,363	1873	6,449	4,228
1874	3,206	3,517	1874	8,024	10,817
1875	2,706	4,353	1875	9,039	14,032
1876	3,313	3,824	1876	9,204	7,740

This table serves as an approximate means of measuring the exports from the two States.

* Much of the Paducah exports, however, are of the tobacco grown west of the Tennessee River.

THE IRON ORES OF KENTUCKY.

THE iron resources of Kentucky are extensive and varied. At a few localities a considerable development of them has been attained; but, taking the State as a whole, it has hardly reached a fraction of the possibilities of production. The greater portion of the ore territory of the State is as yet untouched by the pick of the miner; but enough has been done in most of the ore districts to learn the quality and something of the extent of the ores.

Geographically the ore districts of the State may be divided into the eastern and western.

Geologically the ores of most importance may be divided into three classes, as follows:—

1. The Clinton ore of the Silurian period. This is the equivalent of the Dyestone ore of Tennessee and Virginia.

2. The unstratified Limonites of the Subcarboniferous Limestone.

3. The stratified Carbonates and Limonites of the coal-measures.

There are also ores associated with the Waverly and Devonian Shales in many parts of the State, which have been worked to some extent; but they are of minor importance in comparison with the other varieties of ore. Of the three classes of ore above named the first and the third are found in Eastern and the second and third in Western Kentucky. It may be said also that the ores of the coal-measures are the best developed and of the most importance in Eastern, while the unstratified Limonites of the Subcarboniferous Limestone are of the greatest value in Western Kentucky.

It is also proper to state here that the State has been imperfectly prospected, and that it is altogether possible, and indeed probable, that the ores of one or another of these varieties will be found to be much more extensive and valuable than at present supposed.

The Iron Ores of Eastern Kentucky. — The ore districts of Eastern Kentucky, where the ores have been manufactured, are two, known as the Red River and the Hanging Rock iron regions. The Red River iron region embraces portions of Estill, Lee, Powell, Menifee, and Bath Counties.

The ores found in this region are the Clinton ore, and an ore, stratified, resting upon the Subcarboniferous Limestone at the base of the coal-bearing Shales. It is found both as Carbonate, or clay Ironstone, and as Limonite, or Brown Hematite. It is this ore which has been most largely worked, and upon which the excellent reputation of the iron from this region has been made.

The Clinton ore has not been so extensively worked; but the principal deposit of it is situated geographically near this region, and may be said to belong to it.

The best known deposit of this ore in Kentucky is in Bath County, on the waters of Slate Creek, and is known as the Slate Furnace Ore-bank. It is a stratified deposit of Oölitic Fossiliferous Limonite, capping several hills in the vicinity. It reaches a thickness of fifteen feet at places. The area covered by the ore at this point is somewhat over forty acres, and the total amount of ore about one and a half million tons. The ore bears evidence of having been formerly a Hematite, similar to the Dyestone ore of the same geological horizon along the great valley from New York to Alabama, but it has lain so long, unprotected by any thing except a slight covering of earth, that it has absorbed water, and been converted into a Limonite.

This deposit seems to be somewhat local, — at least of this thickness, — as it grows thin, and finally disappears in this neighborhood. The Limestone which bears the ore is, however, present in a narrow rim all round the central part of the State, and it is probable that, when thorough examination is made, other deposits of the ore will be found.

The following analysis by Dr. Peter and Mr. Talbutt, of the Kentucky Geological Survey, of a sample of ore from this deposit, shows the composition of the ore:—

Iron Peroxide	70.060
Alumina	4.540
Lime Carbonate	.040
Magnesia	.021
Phosphoric Acid	1.620
Sulphuric Acid	.031
Silica and Insoluble Silicates	11.530
Combined Water	12.300
	100.142
Metallic Iron	49.042
Phosphorus	.707
Sulphur	.012

The Dyestone ore, a Fossiliferous Hematite, extends along the flank and foot-hills of the Cumberland Mountain in Virginia, just across the State line from Kentucky, the crest of the mountain forming the line for about forty miles. It lies in two or three beds, ranging from six inches to three feet or more in thickness, and forms in the aggregate an enormous mass of cheaply-obtainable ore. This ore, although situated in Virginia, is of the greatest importance to Kentucky, as it is destined to be smelted with Kentucky coals, which lie on the opposite side of the mountain, and are the only coals accessible to the ore, as there is no coal to the south of the mountain.

This ore, although somewhat phosphatic, is easily worked, and yields from forty to fifty per cent. of iron. From this ore, smelted with stone-coal, iron will probably be made as cheaply as in any region of the country.

The great Pine-Mountain fault, which extends from some distance south of the Kentucky line in Tennessee, in a course about north thirty degrees east through Kentucky to the Chatterawah or Big-Sandy River, at many places is of sufficient uplift to have brought the rocks of the Clinton or Dyestone group above the drainage; and it is probable that on exploration the ore will be found in Kentucky. It has been found at the foot

of the Pine Mountain in Tennessee. In Kentucky the place of the ore is usually covered deeply by the talus from the overlying rocks, which probably accounts for its not having been discovered. Should it be found along the foot of Pine Mountain in Kentucky, it will be most favorably situated for cheap iron-making, as on the opposite side of the stream, which flows at the base of the mountain, there is found excellent coal in great abundance.

The Limestone ore of the Red River iron region, from which the iron is manufactured which gives to the region its reputation, rests upon the Subcarboniferous Limestone, and from this association takes its name. It lies in a bed of irregular thickness, ranging from a few inches to three feet or more in thickness, but probably averaging, where found in any quantity, about one foot thick, or a little less. It is occasionally irregular and uncertain in its distribution; but, in general, it may be said that it is found in its proper position almost wherever the Subcarboniferous Limestone is above the drainage, along the edge of the coal-measures from the Kentucky to the Ohio River. South of the Kentucky River the ore is known to extend a short distance, as far as it has been explored; but its limit in this direction is as yet unknown.

The Red River region embraces, however, only that portion between the Licking and the Kentucky Rivers. This region has been little developed, except in a portion of Estill County, where four charcoal-furnaces have been in operation. There are many eligible sites for charcoal-furnaces in this region, where timber and ore are both in abundance and as yet untouched. The development of this region has been retarded by the lack of transportation facilities, as the iron had to be hauled a long distance in wagons to railroad or river. This difficulty is likely to be remedied in the near future by the construction of one or two projected railroads into or along the edge of this region, and we can then look for a largely-increased production of the excellent iron from this region. The iron is of great strength, and ranks very high in the markets of the West. It is used principally for car-wheel purposes, as it is of very great strength and chills well.

The following analyses show the character of the ore of this region:—

	No. 1.	No. 2.	No. 3.	No. 4.
Iron Peroxide	66.329	* 63.535	74.127	65.591
Alumina	12.532	2.798	3.542	5.762
Lime Carbonate	trace.	.450	.390	trace.
Magnesia	.173	1.073	.461	.248
Phosphoric Acid	.709	.537	.601	.447
Silica and Insoluble Silicates .	9.720	20.480	9.580	16.230
Combined Water	9.580	9.800	11.270	11.060
Total	99.043	100.673	99.971	99.914
Metallic Iron	46.440	45.874	51.889	45.914
Phosphorus	.309	.234	.262	.195

No. 1. From the Richardson Bank, Clear Creek, Bath County.

No. 2. From Logan Ridge, Estill Furnace, Estill County.

No. 3. From Thacker Ridge, near Fitchburg, Estill County.

No. 4. From Horse Ridge, Cottage Furnace, Estill County.

The above analyses were made by Dr. Peter and Mr. J. H. Talbutt, chemists of the Kentucky Geological Survey, from samples selected by the writer.

THE HANGING ROCK IRON REGION.

The Kentucky division of the Hanging Rock Iron Region at present embraces the whole, or parts, of Greenup, Boyd, Carter, and Lawrence Counties. The ores are stratified Carbonates and Limonites, occurring in the lower coal-measures, beginning with the ore just described, resting upon the Sub-carboniferous Limestone, and extending through six hundred to seven hundred feet of the coal-measure strata. The ores are mineralogically similar, but differ somewhat in their physical character and circumstances of deposition. They are popularly known as Limestone, Block, and Kidney ores. They usually occur at well defined geological levels, but do not always form connected beds. They also differ in thickness, ranging from four to eight inches in some of the thinner beds to fourteen feet in one local deposit. This latter is the Lambert ore of Carter County. The most common thickness is from six inches to one foot. There are from ten to twelve ore

beds which are of more than local extent in this region. In addition there are numerous local beds, one or more of which is found at nearly every furnace. This region supports eleven charcoal and two stone-coal furnaces. The Hanging Rock iron bears a reputation for excellence for general foundry purposes, which is unsurpassed by any iron in the United States. The iron produced is mostly hot-blast charcoal iron; but some of the furnaces are worked with cold-blast for the production of car-wheel iron. The reputation of the iron of this region is, however, chiefly founded upon its excellence for castings of all sorts. The iron combines in a remarkable degree great strength with fluidity in casting, and non-shrinkage on cooling.

The stone-coal iron of this region is used almost entirely for the manufacture of bar iron and nails.

The stone-coal iron is made from the ores of this region mixed with a considerable proportion of ore from other States. The fuel used is the celebrated Ashland, or Coalton coal. It is a dry-burning, non-coking coal, which is used raw in the furnace, and is of such excellent quality that no admixture of coke with it in the furnaces is necessary, as is the case with most of the other non-coking furnace coals of the West.

The charcoal iron is manufactured exclusively from the native ores, which yield, as shown by the books at a number of the furnaces, for periods ranging from one to four years, an average of between thirty-one and thirty-two per cent. of iron. The ores of the region are known as Limestone, Block, and Kidney ores. These names are due to peculiarities of structure or position, rather than to any essential difference in chemical composition. As a rule, however, the Limestone ores are the richest and most uniform in quality. The Kidney ores are next in value; while the Block ores present greater variations in quality than any other, some of them being equal to the best of this region, and some so silicious and lean that they cannot be profitably worked.

The following analyses by Dr. Peter and Mr. Talbutt, of the Kentucky Geological Survey, show the composition of some of the ores of each class in this region:—

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.
Iron Peroxide. . .	67.859	71.680	54.530	68.928	61.344	66.200
Alumina	1.160	4.155	2.120	2.768	4.236	3.907
Mang. Brown Oxide . .	.980	.090	1.380	.290	. . .	.030
Lime Carbonate . .	.120	.380	.040	.680	.750	.430
Magnesia	1.275	.050	1.823	.641	.208	.345
Phosphoric Acid . .	.143	.084	.908	.249	.795	.130
Sulphuric Acid . .	. . .	.270	.336	.748	.041	.182
Silica and Insoluble Silicates. . . .	15.560	12.650	28.360	15.240	21.480	16.530
Combined Water . .	*12.903	10.800	10.900	11.100	11.200	11.730
Total	100.000	100.159	100.397	100.643	100.054	99.484
Metallic Iron . . .	47.501	50.176	38.171	48.249	42.941	46.340
Sulphur	. . .	.108	.134	.298	.016	.072
Phosphorus	.062	.036	.428	.098	.347	.057

* And loss.

No. 1. Lower Limestone Ore, Kenton Furnace, Greenup County.

No. 2. Upper Limestone Ore, Graham Bank, near Willard, Carter County.

No. 3. Lower Block Ore, Kenton Furnace, Greenup County.

No. 4. Upper or Main Block Ore, Laurel Furnace, Greenup County.

No. 5. Yellow Kidney Ore, Buena Vista Furnace, Boyd County.

No. 6. Yellow Kidney Ore, Mount Savage Furnace, Carter County.

THE IRON ORES OF WESTERN KENTUCKY.

The most extensive and best developed ore region of Western Kentucky is called the Cumberland River iron region. It embraces the whole, or parts of, Trigg, Lyon, Livingstone, Crittenden, and Caldwell Counties. The ores of this region are Limonites found resting in the clay and chert above the St. Louis or Subcarboniferous Limestone. They occur in deposits of irregular shape and uncertain extent, but in the aggregate the amount of ore is immense. The ores are distributed with great irregularity throughout this region, but they seem to be found in greatest abundance and quantity where the Limestone has been most extensively worn away, and where, as a consequence, the clay and chert which are the result of its decomposition are of greatest thickness.

The ores are, perhaps, found in greater abundance in the country between the Cumberland and Tennessee Rivers than in any other portion of this region, although there

are extensive deposits on the east side of the Cumberland River which have been largely worked. As a rule, however, the deposits decrease in size and frequency in going from the Cumberland River toward the east, and, after a few miles' distance from the river is reached, they are scattering and small. The ores are of excellent quality, being almost entirely free from sulphur, and containing but a small amount of phosphorus; but they are sometimes mixed with chert and sand. The quality in this respect is as variable as the size of the deposits; the ore in the same deposit frequently showing all degrees of admixture with chert, from a chert breccia, to a rich, pure ore with only an occasional lump of chert enclosed.

The average yield of iron from the ore at the furnaces of this region, where it is not very carefully selected previous to roasting, is between thirty and thirty-five per cent. With careful sorting the yield can be brought much higher, from forty to fifty per cent.

The iron produced from these ores is of a very high grade. There are three active furnaces in this region which use charcoal fuel exclusively for the production of pig-iron. From this iron is manufactured the celebrated Hillman's boiler-plate, of which it is said, by the manufacturers, that no boiler constructed of this iron has ever exploded. This iron ranks equal, or superior, to any other boiler-plate manufactured in the United States. It is used largely for steamboat and locomotive boilers, for which latter purpose it finds an extensive market, even as far as the Pacific slope.

Considerable ore from this region has been shipped to furnaces at a distance; but within the past two years the depressed condition of the iron market has rendered this unprofitable. This region is well situated as regards transportation facilities, — it being drained by the two navigable rivers, the Cumberland and Tennessee, and on the lower border by the Ohio, so that the iron manufactured here can be very cheaply placed in market.

The following analyses of two samples of ore from the Suwannee furnace-lands, Lyon County, will show the charac-

ter of the ore from this region. The analyses are by Dr. Peter and Mr. Talbutt of the Kentucky Geological Survey:—

	No. 1.	No. 2.
Iron Peroxide	59.370	70.518
Alumina	1.622	.045
Manganese	.090	.190
Lime Carbonate	.170	.090
Magnesia	.100	trace.
Phosphoric Acid	.179	.275
Sulphur	.212	.045
Silica and Insoluble Silicates .	30.000	18.910
Combined Water	8.400	9.850
Total	100.053	99.923
Metallic Iron	41.559	49.363
Phosphorus	.077	.120

This same variety of ore is found, in greater or less quantity, in many other counties where the St. Louis Limestone is the prevailing rock formation, but in none of them, save those mentioned, has any extensive iron industry been established. In the Cumberland-River iron region there are many furnace-sites unoccupied where iron can be cheaply and profitably manufactured.

This region is capable of, and destined to, a much greater development than it has yet attained. The charcoal-iron manufacture will always be an important and extensive industry, for over a large part of the region the most profitable use that can be made of the land is the production of timber for charcoal. There is destined at no far-distant day to be a large stone-coal or coke iron industry established here, using the ores of this region with the coals of the Western Kentucky coal-field, either raw or coked. The best known of the Western coals at present are too sulphurous for use in iron-making, without previous separation from sulphur by washing and coking. It is through the introduction of modern machinery and ovens, by which these operations can be cheaply and thoroughly effected, and a coke fit for iron-smelting produced, that the coal and iron ore of Western Kentucky will be most profitably and extensively developed. The Louisville, Paducah, and

South-western Railroad affords direct communication between the coal and ore fields. Already measures are in progress for the erection of extensive coke-works on the line of this railroad, which will doubtless prove but the first step in the successful development of a different form and more extensive iron industry than any yet established in Western Kentucky.

THE NOLIN-RIVER DISTRICT.

In Edmonson and Grayson Counties, north of Green River, between Nolin River and Bear Creek, is an area of considerable size called the Nolin-River District. The ores of this region are stratified Carbonates and Limonites, found near the base of the coal-measures. The ore of most value occurs above the Conglomerate. It is about four feet thick, and, so far as present developments indicate, underlies an area of large extent. It is almost wholly undeveloped. A number of years since a small charcoal furnace was established on Nolin River, but it was so far from market, and transportation of the iron was so uncertain and expensive, that the enterprise soon failed. It ran long enough, however, to establish the fact that an excellent iron could be made from these ores.

The following analyses, by Dr. Peter and Mr. Talbutt, show the quality of a sample of this ore from near the head of Beaver-Dam Creek in Edmonson County:—

Iron Peroxide.	52.926
Alumina	4.792
Manganese	.210
Lime Carbonate	.180
Magnesia	.425
Phosphoric Acid	.355
Sulphuric Acid	1.43
Silica and Insoluble Silicates	30.580
Combined water	10.400
Total	100.011
Metallic Iron	37.048
Phosphorus	.154
Sulphur	.057

In addition to the great amount of timber available for charcoal, stone-coal in abundance occurs in the same region. This coal is the lowest of the series, and is of most excellent quality, — analyses showing it to be far superior to the higher coals of Western Kentucky, which are the ones more generally mined. This region is now more accessible than formerly as it lies within fifteen miles of the Louisville, Paducah, and South-western Railroad; but the lack of transportation facilities directly to it has prevented its development. The aggregate amount of ore, coal, and timber suitable for charcoal in this region, is immense, and it offers great opportunities for development. It is one of the most richly endowed undeveloped iron regions of the State.

In many other localities in the Western coal-field iron ores have been found, but they have not been thoroughly prospected, and little is known of their extent. One of the best-known localities of this sort is in Muhlenburg County. In this county are found, at Airdrie Furnace, on Green River, and at Buckner Furnace, near Greenville, deposits of so-called black-band iron ore, — a ferruginous bituminous Shale, yielding about thirty per cent. of iron. At Airdrie Furnace this ore rests immediately above an excellent coking coal, and the two can be mined together very cheaply. At this place iron can be produced very cheaply by bringing ore from the Cumberland-River region, and using it in admixture with the native ore. For a more detailed description of this locality, see Report in the second volume, new series, "Kentucky Geological Reports, on the Airdrie Furnace."

The above described localities embrace all the most important iron-ore districts of the State. There are numerous ore deposits at other places, some of which have been worked, but, in comparison with the others, to a small extent only.

For more detailed information in regard to some of these districts, the reader is referred to the volumes, first series, "Kentucky Geological Reports;" to the "Report on the Iron Ores of Greenup, Boyd, and Carter Counties," in the first volume, second series; to the "Report on the Geology of the

Nolin-River District," in the second volume, second series; to the forthcoming reports on the iron ores in the vicinity of Cumberland Gap, and on the iron ores of the Red-River iron region, in the fourth volume, second series, "Kentucky Geological Reports."

SECTIONAL ADVANTAGES OF KENTUCKY FOR AGRICULTURE, HORTICULTURE, AND FRUIT-GROWING.

The peculiar advantages which Kentucky possesses, through her topographical position, render her adaptability for agriculture, horticulture, and fruit-bearing purposes equal to any, if not superior to most, countries on the globe. She is located in the heart of the North American continent, in the heart of the north temperate zone, in the heart of the great Mississippi river valley, in the heart of the Ohio river valley, in the heart of that immense farming region extending from the Alleghenies to the Rocky Mountains, in the heart of the United States, and in the very heart of American civilization.

Being from 400 to 4,500 feet above the sea level, and on the same latitude as Italy and Spain, but distant from the ocean, Kentucky produces every vegetable, cereal, or fruit indigenous to the temperate zone, in its greatest perfection, although on account of the different classes of soils, caused by various geological formations, some parts of the State excel in one class of productions, while other parts become noted for other staples which find here their native plant food.

For the convenience of persons unacquainted with the varieties of the soils in the State, a brief description of the peculiar local productive powers of the different sections or counties will here be given.

Beginning in the southwest corner of Kentucky, we find, west of the Tennessee river, seven counties—Fulton, Hickman, Ballard, McCracken, Graves, Calloway, and Marshall—with a territory of about 1,300,000 acres, and a population of 85,000 persons. The geological formation of this section is altogether tertiary or quaternary, with no rocks, except a few stones intermixed with the more sandy soils. The upper surface of the lands is composed generally of a rich vegetable loam, particularly adapted to the production of fine tobaccos, corn, and the cereals.

The bottom lands on the rivers and creeks grow Indian corn (maize), all kinds of vines, and hay in great perfection, while the uplands produce the finest quality of peaches, grapes, and other fruits. All garden vegetables and smaller fruits, nuts and berries, flourish well in every locality. Game and fish are most plentiful, and stock is easily kept on the native grasses.

This soil is very easy of cultivation, and timber is abundant for all purposes of the farm. There is less than one third of the land cleared of the native growth, two thirds of the country as yet being in its virgin richness. These lands are capable of supplying food for ten times their present population without reaching the maximum of the more densely populated countries of Europe or Asia.

The people are frank, generous, noble, and patriotic, and would welcome the arrival of immigrants with true Kentucky hospitality. The lands vary in price from \$2 to \$25, according to improvements, location, &c.

Between the Tennessee and Cumberland rivers is a small strip of country, embracing about 200,000 acres, in Trigg, Lyon, and Livingston counties, that abounds in the finest timber and iron ores, but much of it too broken to be of great agricultural value, except that portion along the river bottoms and parts of Trigg and Livingston counties, which are exceedingly fertile.

These lands, however, are well adapted to the cultivation of fruits and vegetables, and will in the future be filled with excellent gardens, vineyards, and orchards. The iron ores and timber of this section are practically inexhaustible, and can no doubt be made as profitable as any portion of the iron region, similarly situated, between these two rivers in Tennessee. At the present time these lands can be purchased at from one to ten dollars per acre.

The counties of Livingston, Crittenden, Lyon, Caldwell, Trigg, Christian, Todd, Logan, Simpson, Warren, Allen, Monroe, Barren, and parts of Butler and Edmonson, lie upon what is known as the "sub-carboniferous or cavernous limestone" formation, and contain much of the finest agricultural lands in the Mississippi valley. These counties aggregate about 5,000,000 acres of land, with a population of about 220,000 persons. The northern parts of some of these counties underlie large areas of what is known as the West Kentucky or Illinois coal field, in which are many valuable mines of the best quality of bituminous coals. The timber of these coal lands is of excellent quality, and in quantities such as are to be found in but few localities in the Western States.

The soil of the best lands, formerly called "the barrens" or prairie, consists of a rich black vegetable mould, with a subsoil of deep red or yellowish-red and chocolate-colored clay, very firm, solid, and tenacious when dry, in which are to be found in large quantities lime, iron oxides, soluble potash, nitrogen, silex, and nearly all the essential elements of

plant food needed by the cereals, tobacco, flax, garden vegetables, hard timber, grapes, and other fruits. This is the great reservoir for fertilizers applied to these lands, wherein all kinds of manures, applied to the soil, is stored by nature until needed for the use of vegetation. The native or "barren grass" has been killed out by fire, cattle, and the growth of young timber, but orchard grass, millet, red top, clover, timothy, and various other grasses, grow as well here as in any portion of the State.

The tobaccos grown in these countries are the richest, heaviest, and best for shipping purposes of any grown on the continent, and are known in commerce as the "Heavy Hopkinsville," or "Heavy Clarks-ville," "African Shippers," and Mexican Bailers," taking the names from the market places.

Nowhere in the United States can a man support his family with more ease and less labor, and furnish them with more luxuries, than on these Kentucky "barren lands," and nowhere else can be found so large a tract of level, rich, lasting, and well-drained soil in one continuous body. Truly, nature has here exerted herself to form for man's use a "farmer's garden land," blest with every requisite for prosperity and comfort, without the want of any essential necessity.

Previous to the war this section was rich and prosperous, and the people are fast recovering from the ravages of that disastrous conflict, and the country again beginning to teem with plenty. No part of the country possesses a more intelligent, or industrious, thriving population, or is more noted than this for its high-toned chivalry and true hospitality. Lands in many localities, previous to the late war, were sold as high as \$75 to \$80 per acre; they are now worth from \$5 to \$50 per acre.

The counties of Union, Henderson, Webster, Hopkins, Muhlenburg, McLean, Daviess, Hancock, Ohio, Grayson, Breckinridge, and parts of Butler and Edmonson, are situated on the carboniferous rocks that form the basis of the western coal fields of Kentucky. They contain about 3,200,000 acres of land, with a population of about 160,000.

The soil of these counties is most varied, owing to the peculiar geological formations. Union, Henderson, Daviess, and McLean, lying immediately upon the Green and Ohio rivers, will average as rich in soil as any other counties in the entire Mississippi valley, while the mixture of good and poor lands, to be found elsewhere, will enable a farmer to settle on any formation he chooses. The noted "Yellow Banks" stemming tobacco grows everywhere in this section of Kentucky, while corn, wheat, oats, flax, hemp, potatoes, hay, &c., flourish as well as in any other part of the Ohio valley.

The timber in these counties, for manufacturing purposes, staves, carpenter's work, or ship-building, is superior to any other portion of the West, both in quality and quantity. There is no plant or cereal indigenous to the north temperate zone that will not grow to perfection in these counties. The coal mines and iron ores are inexhaustible, and can be worked as cheaply as in any other part of the world. The population is thrifty, industrious, and hospitable, and are fast becoming rich through the natural resources of the country.

The counties of Meade, Hardin, Bullitt, Adair, Metcalfe, Green, Taylor, Larue, Hart, Marion, Nelson, and Spencer are located mostly on the sub-carboniferous formation, though in many places intermixed with other formations. They contain about 2,800,000 acres of land, with a population of about 150,000 persons.

This section of the State presents a great variety of soils, some very rich in plant food, and others of a poorer quality. Some of these lands are peculiarly suited for the production of a very fine class of tobacco, cereals, and all kinds of fruits, nuts, and berries. The "Knobby Hills" that pass through these counties afford excellent soil for vineyards and orchards, and will no doubt some day present the people of the Ohio valley with brands of wine equal to any in France or Germany. The whisky known as "Nelson County" is justly celebrated as being but little if any inferior to the old established, world-famed "Bourbon Whiskies" of the blue-grass section of Kentucky. Sheep husbandry appears well adapted to the soil and climate of these counties, and nowhere do sheep come to a higher degree of perfection, either as wool-bearers or for mutton. With a kind, intelligent, and hospitable population, these counties, owing to cheap lands and their general adaptability for the culture of fruits, vines, the cereals, and stock, and their proximity to the city of Louisville and other large cities by railroad and river communication, afford great inducements for immigrants seeking homes in the West. Lands are worth from \$3 to \$40 per acre, according to quality, improvements, and location.

The counties bordering on and adjacent to the Ohio river, from Louisville to Cincinnati, present a mixed soil. The general face of the country is undulating, the hills in some places being quite abrupt but not mountainous, while in others the surface is nearly level. These "hilly knobs" are very fertile, and produce most excellent blue-grass, cereals, fruits, vegetables, and the finest quality of "cutting tobacco." Here, too, grapes grow to perfection, and apples flourish equal to anywhere

else in the State, while stock of all kinds, particularly sheep and cattle, thrive and obtain exceeding large growths—many sheep weighing from 400 to 450 pounds without extra attention, and cattle weighing as much as in the best grass-growing counties of England. The extra facilities for selling the produce of these counties, either in the Louisville or Cincinnati markets, give superior advantages to the farmers not enjoyed by the agricultural population of the far Western States, and make the clear profits of the farm, the dairy, the garden, the orchard, or the vineyard greatly larger than the income from a like amount of labor in any of the trans-Mississippi States. Immigrants can find in many of these and other counties rich virgin lands, as yet uncleared of the native forest trees, in accessible and eligible localities, to be purchased in fee-simple, at from five to fifty dollars per acre, which will amply repay the investment and labor of putting them in cultivation, and afford a home among a cultivated and refined people, where can be enjoyed all the comforts and luxuries of any European country, at probably one third of the cost and less than one half of the labor there required.

Jefferson county, in which Louisville, the metropolitan city of the State, is situated, is richer in all respects than its immediate neighbors. All the lands are fertile, valuable, productive, and in demand at high prices, not only for farms, but also for vegetable gardens, orchards, and vineyards. The markets furnished the owners of these lands by the growing city make them cheap at almost any price.

The "Blue Grass Region" proper of Kentucky consists of the following counties: Fayette, Bourbon, Scott, Woodford, Clark, Jessamine, Madison, Garrard, Mercer, Franklin, Anderson, Owen, Trimble, Carroll, Gallatin, Boone, Kenton, Campbell, Grant, Pendleton, Bracken, Mason, Robertson, Harrison, Nicholas, and parts of Montgomery, Bath, Fleming, Lewis, Oldham, Henry, Shelby, Spencer, Washington, Boyle, and Lincoln, all of which is located on the blue limestone or Lower Silurian formation. This geological formation is productive of the richest soils on the globe, and although these counties lie on this rock, yet they are not all equally fertile, owing to some parts of the country being more hilly or broken than others, and also to the "faults" in the formation, whereby there are frequent intrusions of the Upper Silurian, with occasional strips of the Devonian, and Waverly groups of rocks, with their accompanying clays and soils.

In Fayette, Woodford, Scott, Bourbon, Mason, Madison, Clark, and Jessamine counties are the best hemp lands to be found in the United

States, except some spots in other counties within this same "Blue Grass Region."

These best lands are worth from \$75 to \$140 per acre, the farms being generally from 100 to 300 acres; second-rate lands in these counties sell at from fifty to sixty dollars per acre; wages are from \$12 to \$18 per month for farm hands, with board, and from \$1 50 to \$4 00 per day for mechanics, according to skill and the character of work.

The prevalent growth of timber in this region includes ash, oak, walnut, locust, maple, wild cherry, hickory, hackberry, gum, beech, poplar, and elm. All cereals grow most luxuriantly on the soil. Indian corn, wheat, rye, oats, barley, millet, flax, hemp, vegetables, and fruits all are produced in most abundant crops. Tobacco is cultivated on the second-rate lands, and in the counties bordering on the Ohio and lower Kentucky rivers, and is produced in large quantities, and of a quality superior to any other for "cutting leaf;" but the lands suitable for hemp produce tobacco of too coarse a texture. Blue-grass here reigns supreme, although clover, timothy, Hungarian grass, orchard, red top, and various other grasses, are grown with profit.

Franklin, Mercer, Garrard, Shelby, Harrison, Nicholas, Boyle, Montgomery, and Lincoln are all very fine counties, containing much first-class lands, which are worth \$100 per acre, while second-class are rated at from \$10 to \$35. The other counties, though not altogether so rich, have a great deal of excellent lands, and are capable of producing very large crops of all kinds of cereals, tobacco, and grasses. The price of lands vary exceedingly, from \$8 to \$50, according to quality, location, and improvements.

The disintegration of the blue limestone and magnesian rocks and marls of this section of Kentucky gives a soil almost black, and so filled with carbonaceous plant food as to appear almost unctious. The sub-soil is a clay, of deep red or yellowish hue, which, when exposed to the atmosphere, becomes itself good soil, and produces first-class crops. The beauty of this region is remarkable, whether seen in the spring and summer, when carpeted with its covering of rich feathery turfs of blue grass, two and three feet high, in perfect meadow, even among the forest groves, where it grows must luxuriantly, or in the winter, when these same pastures are clothed in rich yellow and green vendure that seems never to entirely stop growing. Water percolating through the clay and rocks becomes impregnated with those peculiar chemical elements that give the distinguishing characteristics to the "Bourbon Whisky," so

celebrated throughout the world. The water, and also the grain raised on these lands, so act on the animal economy as to produce the firmest, hardest, and most solid bones, and the toughest and most elastic muscles, with the capacity of taking on the largest possible amount of fat. These causes make the "Blue Grass Stock" the finest in the world, and give that power of endurance to the horse, and that solid flesh to the cattle and mutton, not to be found elsewhere. The turf registers of the country exhibit the fact that nearly three fourths of all the noted races, whether in running or trotting, in the United States, have been won by horses bred in this section of Kentucky. The richest and best milk, butter, and cheese on the continent, also come from this central section of the State.

Railroads and turnpikes thread every portion of this Blue Grass section; so that, practically, markets are at every man's door for all the varied products of his farm, his garden, his orchard, or his vineyard. The late David Dale Owen, the distinguished State Geologist, says in his report: "In presenting these chemico-agricultural results to the farming community of the Commonwealth of Kentucky, I cannot help believing that, while they form one of the most valuable contributions which the united labors of the geologist and chemist have ever presented to agriculture, they must advance the science of agricultural chemistry, and supply hints to the agriculturist and owners of landed estates of the highest practical importance, and they must, at the same time, impress the public generally, most forcibly, with the extraordinary fertility of a very large portion of the area of Kentucky, especially that based on the blue limestone formation, most of the soils of which *will compare favorably with the richest lands on the face of the earth*, and surpass, in elements of permanent fertility, the far-famed prairie lands of the West, except where those prairie soils are based on the same description of highly fossiliferous limestones and marly earths and calcareous clays."

All that part of the country lying east of the "Blue Grass Region," and east of the central southern counties, is known as the hilly or mountainous counties of Kentucky, and covers an area of about 8,000,000 of acres, nearly all of which is underlaid by one continuous bed of coal and iron ores. This is known as the Eastern Kentucky coal field, to distinguish it from the Illinois coal field in the western part of the State. The geological formation of this section embraces sandstone, shale, iron-

stone, millstone grit, freestone, conglomerates, limestone, marble, &c., from which are derived soils by no means unproductive, if properly and skillfully treated.

The cereals, flax, tobacco, grapes, fruits, and all kinds of vegetables, grow well wherever the land is not too hilly or abrupt for cultivation. The timber of these counties is practically inexhaustible, and consists of every variety known in the North American forests. Mineral springs here abound of excellent quality, and also coal oil wells in many localities, producing the best grades of lubricating and burning oils and bitumen tar. The climate and healthfulness of these mountain counties cannot be excelled, while the scenery, in many places, is equal to any in Europe. Sheep husbandry can nowhere be followed with greater success than in this part of Kentucky, where the native grasses, and blue-grass on the ridge lands, afford a perpetual pasture for all kinds of stock. Wild fruits, nuts, grapes, game, and fish everywhere abound, and give employment for those seeking amusements in hunting and fishing, as well as the most delicate of food to the inhabitants.

The immense beds of iron ores and coal will make this region, within a few years, the best mining district in the west, and cause new industries to be opened up, which will enrich all who have the enterprise and capital to engage in mining and manufacturing ventures.

Immigrants from the hill countries of Europe will find here homes suited to their fancy, with lands susceptible of producing large crops by skillful cultivation, and capable of supplying food, clothing, and all luxuries to his family, with less than half the labor required in his fatherland. This country is developing steadily, and at no very distant day must be one of the most delightful mountain sections for residences and health in the United States. The people are kind, intelligent, hospitable, and anxious to have the resources of the country developed as fast as capital and skilled labor can be brought into the State.

Grapes flourish here as well as they do in the mountainous countries of Switzerland, France, Spain, or Germany, and wine-making might be as cheaply conducted on these highly fertile calcareous limestone soils as on any other part of the earth. The warm climate, too, imparts to the grape a richness that is rarely met with even in the south of France. No portion of the United States presents cheaper lands, with such favorable surrounding, than does this mountain section of Kentucky.

MANUFACTURING CAPACITY AND DOMESTIC ARTS.

It seems strange to say that a State, endowed by nature with such immense agricultural resources as Kentucky, should at the same time be one of the most advantageously located for mechanical and manufacturing trades of any other equal-sized territory on the globe. Yet such is the fact, as the statistics of the raw materials, climate, cheap fuel, water-power, and centrality of position will show. Situated midway between the Gulf of Mexico and the northern lakes, and also between the eastern and western ranges of the North American mountains, Louisville, the largest city in the State, becomes the focal point of the great Mississippi Valley. Here, by easy water communication and railroad facilities, can be concentrated the cheapest iron, coal, hard timber, as well as cabinet timber, potter's clay, kaolin, fire-clay, marble, lithographic stone, fine-grain building stone, cement, glass sand, marl, and fluor-spar to be found on the continent.

There is scarcely a spot favorably situated in the State that has not, most convenient and surrounding it, all kinds of workable timber, iron, and coal, the greatest variety of earths and sands, besides inexhaustible supplies of every class of agricultural products and raw material, such as corn, wheat, rye, oats, barley, flax, hemp, wool, cotton, tobacco, sorghum, hides, tan-bark, high wines, alcohol, honey, grapes, fruits, berries, nuts, and medicinal plants. In addition to these things, the climate is such as never to stop machinery, either through the debilitating effect of the summer's heat or the excessive cold of winter.

The articles of food for operatives and their families, whether in breadstuffs, vegetables, fruits, fish, or meats, can be supplied here cheaper by fifty per cent. than in any part of Europe, and of better quality; for this State is the central location of good beef, good pork, good mutton, good butter, good milk, good cheese, good poultry, good wheat, good barley, good corn, good garden vegetables, and good fruit.

In water-power Kentucky excels any other State in the North American Union, when we take into consideration the freedom from winter freezes. The people of this State have always been mainly an agricultural community, as is shown by the production of the staple crops grown on her soil. The Auditor's Report for 1876 shows the following productions for that year of some of our staple crops, which is fa-

below the real amount, viz: Tobacco, 156,136,910 pounds; corn (maize), 68,944,114 bushels; wheat, 5,031,469 bushels; hemp, 14,923,519 pounds; hay, 122,696 tons; barley, 148,004 bushels; all of which is available at home for manufacturing purposes, besides the large stocks of the same and other articles received from neighboring States.

The variety of new manufacturing industries, springing up all over the State since the close of the late civil war, is unprecedented, even in the American States, and yet they form but a tithe of what is needed to supply the increasing wants of our own people and our neighbors.

What we most need is more skilled laborers and more capital to develop the resources of the mineral, coal, timber, agricultural and manufacturing wealth; and when this is acquired, the centre of the machinery labor of the American nation will be in the State of Kentucky.

At the late Centennial Celebration at Philadelphia there was exhibited by Kentucky nothing from her factories. A collection of minerals, ores, specimens of coals, &c., were nearly all that were put on exhibition; yet these were sufficient to show how immense were our facilities for furnishing the raw material for manufacturing all kinds of goods and wares when the necessary capital and labor were once introduced into the State.

Our Geological Survey has established the fact that Kentucky, for factory purposes, has more coal, iron, and timber than Pennsylvania or any other State of the Union, and more of each than England, Scotland, Wales, and Ireland combined, or any one of the central countries of Europe.

With these resources, it is impossible to tell what will be the extent of the mechanical and manufacturing interests that will be developed within the next century, or how these developments will influence the future of the country.

We will mention in this connection, because it will hereafter have a great bearing on the iron manufactories in the United States, the peculiar qualities of what is known as "Block Coal," which is found in quantities practically inexhaustible, within fifty to eighty miles of Louisville, on the Indiana side of the river, and which, no doubt, also exists in even greater quantities in Kentucky, as it is found in an extension of the same great coal field that crops out so richly in the counties bordering on the Ohio river below Louisville.

This "Block Coal" is pronounced by ironmasters equal to the best in the world for iron-smelting, and all other purposes of iron and steel man-

ufacture, and none of it superior to that which is situated within fifty miles of the Falls of the Ohio, immediately along the line of the "Louisville and St. Louis Air-line Railway," from which mines this coal is now supplied to almost every iron furnace in Indiana, and also to the Bessemer Steel Works at Cleveland, Ohio, at Chicago, and at St. Louis, as well as to the iron manufactories of Cincinnati, Indianapolis, New Albany, and Louisville.

Prof. De Lafontaine, the eminent Swiss Geologist, pronounces the "Block Coal" of this coal field the best in America, and equal, in every respect, to the best Welsh coal. Prof. Foster, the State Geologist, says: "To the purity of splint it unites all the softness and combustibility of wood; and the effect produced by it in the blast furnace, either as to the quality or quantity of the iron, *far exceeds* anything known in the manufacture of that metal with charcoal."

Prof. Cox, the State Geologist, pronounces the "Block Coal" of this field "the best mineral fuel yet known in the world for the manufacture of pig metal, bar iron, or steel."

This "Block Coal" can be used cheaper in Louisville than anthracite can in Philadelphia; is freer of sulphur and phosphoric acid, more deleterious to iron-making, than even charcoal itself. From this and other sources, along her various lines of railway and river routes, Louisville can be supplied with *cheaper fuel* for factory purposes than any other large city in America, while the inexhaustible beds of iron ores, in various parts of the State, are so convenient to her that she will in the future, as she is doing at the present time, be able to manufacture and supply both iron and steel cheaper, and equal in quality, to any made on the continent; and this is why the best iron is now made in Louisville, and can be had cheaper than in any other American city for making locomotives and steamboat boilers, bridges, car-wheels, and all classes of work requiring the toughest metal.

What is here said of the iron factory business may be said also, as far as the same is applicable, of cotton and wool factories, glass factories, edge-tool factories, tanneries, and all classes of machinery works.

The mechanic trades and unions exist in all our larger cities as they do elsewhere; but so great is the demand for this class of laborers, and so remunerative are the wages paid them, and so cheap are the rents and provisions, that we are never bothered about strikes and mobs, as is the case in many of the older countries at the north and in Europe.

Perhaps no country on earth is more blest than Kentucky in having mechanics and laboring men who own their residences, and have their

own homes unencumbered with rent debt. This is a notable feature in Louisville, Covington, Newport, Lexington, Paducah, and elsewhere, and has been the subject of frequent and gratifying reference. It speaks more favorably of this country as a desirable location and home for industrious, frugal, and thrifty mechanics and laborers than any thing that can be written in its praise. Ample room is here for machine-shops of all kinds, and a superabundance of the best, the richest, and the cheapest of food for the mechanic and laborer who may occupy them, with good water, and a most salubrious climate everywhere to be found. More than this cannot be said of any other country, and less would not be doing justice to the great manufacturing resources of Kentucky.

EDUCATIONAL FACILITIES.

The territory that now forms the State of Kentucky one hundred years ago was an unbroken wilderness, uninhabited except by wild beasts and savage Indians. This was the favorite hunting-ground and general battle-field, where met in deadly strife the tribes of the Northwest and the numerous nations of the South. The wild war-whoop and the painted warriors were heard and seen among the heavy forests and beautiful savannahs where now are the happy homes of an independent yeomanry.

These Indian savages, by mutual consent, had probably for centuries designated all that country lying between the Ohio on the north and the Tennessee river on the south to be one grand park, wherein might roam at will the buffalo, the elk, the deer, the bear, the turkey, the grouse, and every other species of game, in immense droves or flocks, increasing without limit, in a land the richest on the continent in native grasses, fruits, and berries, and with a climate so genial and mild in winter as not to cause them to emigrate South, and so cool in summer as not to require them to go North.

From this park all the adjacent tribes procured yearly their winter food, and often most sanguinary and deadly conflicts ensued in case one party intruded upon the hunting-grounds of another, and was overtaken in their poaching expeditions.

When the white races attempted to occupy these lands, all the neighboring tribes joined in one common cause in attempting to expel, from their beautiful hunting-ground, the common enemy. This produced terrible deeds of bloodshed and slaughter in the early settlement of the country, and caused many brave and fearless pioneers to lose their lives in defense of their new-made homes and in the protection of their families. But these days of trouble have long since passed away; the Indian tribes that formerly made this their hunting-ground have melted away before the advancing civilization and unparalleled energy of the nineteenth century, and the remnant of the proud and stubborn savages, once so fierce and powerful on the war-path, and so dreaded by the early settlers, has been pushed west to the base of the Rocky Mountains. The mighty forests, too, have fallen, and the beautiful savannahs have been changed, and in their places are now to be found prosperous villages, flourishing towns, well-built cities, and cultivated farms, bearing an abundance of the fruits, the grains, and riches of honest labor.

The wilderness indeed now blossoms as the rose, and the hum of machinery and busy notes of enterprise and industry ring out from thousands of manufacturing and mechanical establishments. The Indian trail and the buffalo paths have given place to the iron-bound railroads, whereon the locomotive, with its long train of cars, sweeps with lightning speed to ready markets with the bountiful productions of our fertile State.

On that portion of this grand park lying within the limits of Kentucky now dwell not less than a million and a half of free people, living under a democratic State government, one of the most liberal known in history, where every citizen, without respect to parentage, color, or condition, bears an equal part in making the laws, and receives the same protection from them in his life, liberty, and property, and where the school-house, filled with happy children, can be found in every neighborhood.

Kentucky has a Treasury overflowing with money, and no State debt continually pressing for payment; pays interest on no vast amount of borrowed capital, like many of her sister States; yet she collects less taxes *pro rata* from her citizens than any country, among the civilized communities of man, wherewith to pay the annual expenses of her government.

The entire State tax is but forty cents on the one hundred dollars' worth of property, of which amount twenty-five cents on the hundred

dollars, or largely over one half, go to the public school fund, in order to educate the children of the State, and the other fifteen cents on the one hundred dollars' worth of property, estimated at a very low rate, go to pay the running expenses of the State in its public capacity.

With the State, the general education of her children is a subject of paramount importance. Her system of public schools now in operation supplies to the children of the Commonwealth over six years of age nearly six thousand teachers, and with about two millions of dollars' worth of school-houses, thus affording to every child in the State, white or black, whose parents will accept of the advantages, a chance to obtain a good common school education.

This system of education is entirely free of any religious sectarianism, either in regard to teachers or text-books, and by law must so remain, without regard to the religious views or sectarian prejudices of parents or guardians.

Besides the common schools, all the cities and larger towns, as well as many of the smaller villages and country neighborhoods, have school systems of their own, by which the children within their limits can be educated free, or by the joint application of the State and local funds. The cities (Louisville and Henderson, for instance), in addition to their common schools, have also a grade of "high schools," in which the languages and the higher branches of literature and science are taught to students who have successfully passed through the primary departments.

There is a State "Agricultural and Mechanical College" at Lexington, endowed by the Commonwealth, to which each county can send, free of tuition, three times as many students as she has members in the legislative body of the State. At this institution are taught, in addition to the general routine of classical literature and common school studies, mathematics, the ancient and modern languages, military drill according to the tactics used by the United States army, and also the application of science to agriculture and mechanical pursuits.

There are in the State some ten to twelve other male universities and colleges, all managed by highly educated and scientific faculties, and well patronized by highly advanced intellectual students. Several of these institutions have military drill after the manner of the National Military Academy at West Point. There are also between ninety and one hundred male and female academies, high schools, seminaries, and select schools, of superior rank, in the different counties of the State, besides numerous private schools, all well patronized by citizens of Kentucky and other States.

There are separate State institutions, supported entirely by the Commonwealth, for the education of the deaf, the dumb, the blind, and the feeble-minded children, in elegant public buildings, and convenient to all of her citizens who are so unfortunate as to have children thus afflicted.

The poor and unfortunate lunatics and idiots of the State are taken care of and provided with comfortable homes and medical attention at the three large, elegantly built, and well provided "Lunatic Asylums" that now adorn our good old Commonwealth. These asylums are among the largest, and are said, by competent experts, to be the best arranged and appointed, and the most skillfully managed, of any similar institutions in the world. The State pays the entire charges of all the patients, including traveling expenses and clothing.

While Kentucky possesses all these facilities for good schools at which to educate her children, and asylums in which to take care of the unfortunate of her people, she is well provided with churches and with benevolent and social societies, embracing among their number nearly every order known in America or Europe.

The people of the entire State are distinguished for their intelligence, generous hospitality, genial social characteristics, and chivalrous bearing. There is no caste here, founded on long lists of ancestral names, on religion, on politics, or on wealth, and nothing of that haughty aristocracy arising from these causes. Men and women are not ostracised from society because they may happen to be poor, but are admitted upon their real merits in mental, moral, and social culture, without regard to worldly position or possessions. Among our foreign-born population, or those whose parents, one or both, were foreign-born, there remain all those generous characteristics and social customs of the fatherland that were wont to be practiced in the "old country," and these make immigrants of the same nationality feel at home immediately upon coming among us.

The native-born citizens of other sister States, as well as people from foreign lands who come here, will be pleased with the educational facilities of our State, and will find all the advantages of the most refined society, and will receive a cordial welcome from all native-born Kentuckians.

CITIES AND TOWNS.

The rich virgin soil of Kentucky naturally caused the first settlers to become agriculturists, and to concentrate their energies in developing the farms, whereon could be produced everything needed, either for food or clothing. Domestic economy had early taught every family to become the home manufacturers of articles made from the native products—wool, cotton, hemp, flax, corn, wheat, barley, oats, &c.—so that from the very beginning of the settlement of the country we find the “domestic arts” in active operation to supply the wants of the people.

This created an independence among the citizens that prevented them from congregating in towns and cities, or engaging in such trades or pursuits as would require them to live in compact communities; therefore, we find that few large metropolitan centres have grown up in the State, although no country ever offered greater facilities for a large manufacturing population or better employment for concentrated capital.

There are within the State some dozen or more cities containing a population from four thousand and upwards, besides hundreds of towns and villages with a less number of inhabitants. A brief synopsis, descriptive of the localities and peculiar advantages of a few of these larger places, may not be uninteresting.

Louisville, the chief metropolitan city of the State, is situated in Jefferson county, at the Falls of the Ohio river, four hundred miles from its mouth, and is without doubt the most beautifully located city in the Western States. It now contains about 160,000 people, and is fast increasing both in wealth and population. This city is remarkable for its healthfulness, as is evidenced by the reports of the National Medical Association of the United States, wherein it appears that, in nine years out of twelve, she exhibited the least mortality, in proportion to population, of any city in the world. This can be readily accounted for on account of the naturally temperate climate, pure air, fine water, ample supply of fresh, well-developed vegetables, good healthy meats, rich milk and butter, well-matured cereals, and the thorough system of drainage. The population are mostly of the native Kentucky and Virginia stock, largely intermixed with the German, English, Welsh, Irish, Scotch, French, and Swedes. So numerous has the German element become

within the city and its suburbs, that it is found necessary to have the German language taught in all the public schools.

Water-power.—The immense water-power at the “Falls of the Ohio,” where that large and beautiful river flows over the ancient coral beds of the Upper Silurian Group, if properly utilized, can be made to drive five times as much machinery as is now active in the city of Manchester, England. This can be done either by making a canal from above the city, thence running south beyond the southern limits, and emptying again into the bed of the Ohio below the city, or probably at less expense, though not so effective, entirely within the corporation limits, by using the present canal and branching it so as to empty the water below Portland. Besides this immense water-power, now almost entirely unused at Louisville, the coal fields of Kentucky and Indiana lie so convenient that the best manufacturing fuel can be delivered at her door as cheaply as the same can be done at Manchester, London, Paris, or any other place on the continent of Europe.

Being at the centre of the tobacco region, she has already become the largest tobacco market in the world. Her iron interest will, within a few years, be as great as any other city of her size in the country. She is now producing bar iron of the finest quality, and at a cheaper rate than any other place in the Union. The same may be said in regard to other industries and factories, such as tanneries, cotton and wool factories, shoe factories, glass factories, and all classes of agricultural implements and furniture, as well as steamboat and ship-building. She even now employs several thousand persons in her various manufacturing industries. The commerce of the city is over \$100,000,000 per year, and rapidly increasing, besides the immense amounts shipped through her to other ports.

Her public free schools, medical, law, and academic colleges, libraries, water-works, gas-works, public buildings, theatres, churches, and eleemosynary institutions are equal to any in the United States, proportioned to the wants of her people.

The society is first-class in every particular—genial, social, hospitable, educated, and refined, there being no caste recognized except that belonging to true intellectual merit. There is no industry, consistent with the welfare of a large city, that may not be exercised here both with honor, advantage, and profit.

The slightest glance at the map of the United States will at once show that nature has indicated three triangular points, where large manufac-

turing and commercial cities are bound to arise and control the destinies of the great Mississippi valley. These are St. Louis, Missouri, Chicago, Illinois, and Louisville, Kentucky, of which the latter place has greatly the advantage over the other two in climate, the richness of the adjacent country, raw materials for factories, water-power, and cheap fuel. Here there is never trouble interfering with the running of machinery, on account of the incompatibility of climate, in summer or winter. Large capitalists, either of our sister States or Europe, seeking places for the establishment of paying enterprises, should never overlook the great advantages presented by the city at the "Falls of the Ohio."

The next city in population is Covington, situated on the Ohio river, in Kenton county, immediately opposite to Cincinnati; and next to Covington is Newport, situated in Campbell county, also opposite to Cincinnati, and separated from Covington by the Licking river. The former contains about 30,000 and the latter about 20,000 people, and each are in fact almost a part of the great city of Cincinnati, although located in a different State.

Whatever can be said of Cincinnati as a great commercial centre, can with equal truth be said of both Covington and Newport, with this addition, that either of the latter cities has a finer location and better adjacent country than Cincinnati, and the two combined will, no doubt, at some time in the great future, equal if not surpass Cincinnati in wealth, population, and importance.

Like all other Kentucky cities, these are peculiarly well located for manufacturing industries, both on account of cheap fuel, and the proximity of all kinds of raw material. Their railroad facilities, of course, are the same as those of Cincinnati, to which they are connected by two most elegant bridges, besides numerous ferries.

Hundred of factories of all kinds are springing up every year both in Covington and Newport, supplying millions of dollars' worth of various kinds of goods and wares, which are sold in Cincinnati. The small space of territory between the Ohio river and the hill, on which Cincinnati is built, has now become very crowded with houses, so that the redundant population will naturally seek better and cheaper homes on the opposite side of the river. This insures, to each of these suburban places, a population sufficient to make them more desirable localities for either factories or residences than Cincinnati itself; accordingly, we find much of the Cincinnati immigration is now locating, and in the future will wisely locate, in these beautiful and healthful Kentucky cities.

Lexington, an elegant city of about 20,000 inhabitants, in Fayette county, stands in a central garden spot of Kentucky, about the middle of the "Blue Grass Region." Possibly no other place of the same size can be found in any country where all the necessities and luxuries of life can be had with less labor. Here are concentrated the finest stock, and the best pedigrees of horses, cattle, sheep, hogs, and poultry, that can be found on the continent; here, and in the counties adjacent, is made that most noted whisky, known throughout the world as "Old Bourbon;" here are the largest hemp factories and some of the best mills in the State, and various small factories of other articles used by the people of Kentucky and the Southern States. The climate, water, and healthiness of Lexington cannot be surpassed, and her public schools, academies, and colleges are equal to any in the western States, Turnpikes radiate in every direction, and three distinct railroads pass through the city, going north, east, south, and west, while several others are in contemplation.

The lands around Lexington are higher in price, and probably richer and more productive, than in almost any other portion of the United States. She has been styled the "Athens of Kentucky," and rightfully deserves the name of the "garden spot of the West."

Paducah, "the growing city of Southwestern Kentucky," is most beautifully situated on the Ohio, immediately below the mouth of the Tennessee river, and contains about 10,000 inhabitants. She is the county seat of McCracken county, and is most advantageously located to become a large commercial and manufacturing city. Iron, coal, lead ores, flour-spar, and the best of building rock, glass-sand, fire-clay, and potter's earth are mined in her immediate neighborhood, while timber, cotton, tobacco, flax, grain, and all kinds of raw materials, are produced in endless supply in all the adjacent counties of Kentucky, Tennessee, and Illinois.

Being the largest city between Louisville and Memphis on the east side of Ohio and Mississippi rivers, she naturally attracts the commerce of a large belt of country from three different States, and by the aid of her never-failing river navigation and railroad connection, is enabled to contend with St. Louis and other northwestern cities for the trade of the Southern States. Already several mills and factories are in successful operation, and others in contemplation, the local advantages being such that time, skilled labor, and capital alone are wanting to make this the manufacturing centre on the lower Ohio river. Immigrants from the North or Europe to this place would find good free common and high

schools, fine churches and public buildings, a hospitable and generous people, a climate unsurpassed, and every kind of food and worldly comforts, as cheaply to be obtained as elsewhere in the western States.

Frankfort, the Capital of the State, and the county seat of Franklin county, is situated in a beautiful cove on the banks of the Kentucky river, immediately on the line of railroad from Louisville to Lexington, 65 miles from the former and 28 miles from the latter place. The population, of nearly seven thousand, is remarkably energetic, industrious, and thrifty; nowhere on the globe can be found, in a city of the same size, a more intelligent, kind, and hospitable people, better public and private schools, finer churches, or relatively more wealth. There are also good water-works and gas-works, and several mills, factories, and distilleries, in which are manufactured goods, wares, and liquors equal to any similar productions made in the State.

The Kentucky river is navigable the entire year by steamboats, and the railroad trains are coming and going at all hours of the day.

The State House and other public buildings are beautifully located on the central square of the city, and make quite a handsome appearance, and although they may not look altogether so massive, grand, and imposing as the State Houses and public buildings of our National Capital, or some of our sister States, yet they form an elegant and beautiful picture, and every Kentuckian, as he looks on them, can say: "Here is the Capital of ONE free and independent State, at least, with a Treasury containing millions for the benefit of her people and her common schools, but that *owes not one cent* to the capitalists of New York, London, Paris, or Frankfort-on-the-Main."

The officers of the State government are by law required to live at the Capital, and to transact all their public business at this point. The Supreme Court of the State also holds its sessions at Frankfort, which frequently concentrates at this point the best legal talent of the State.

The scenery in the immediate neighborhood is grand and beautiful, and every comfort needed by man is here to be had at the cheapest rate. Nature has truly done much to make this a most desirable spot for those seeking a home or business where capital can be employed to advantage in almost any kind of mechanical or manufacturing industry.

Maysville stands on the south bank of the Ohio river, at the mouth of Limestone creek, about sixty-one miles above Cincinnati; is the county seat of Mason county, and contains a population of about six

thousand; situated on an elevated plateau, above all high-water marks. This is one of the most elegant and noted cities in Kentucky, from its having been the first place settled in Northern Kentucky, and the birth-place and home of many of the most distinguished men in the history of the State.

There are several factories and mills now in successful operation, producing large quantities of goods, wares, and agricultural implements, which find ready sale at home and in Cincinnati. The public and private schools are unsurpassed, and the churches and public buildings excellent in design and finish.

The people of Maysville are truly Kentuckian in hospitality, intelligence, and thriftiness, and nowhere is true worth and intellectual superiority more cherished than in this "Athens of Northern Kentucky." As a manufacturing and commercial centre, Maysville has all the requisites, except an abundance of capital and skilled labor. Coal, iron ore, hard timber, tobacco, grain, flax, wool, hemp, and the finest clay and stone, are within easy reach, and only await the enterprise of a healthy immigration to make this one of the most populous and flourishing commercial and manufacturing cities on the Ohio river.

Bowling Green is most beautifully located on Barren river, in Warren county, in the central southern portion of the State, and contains a population of six thousand people. Here nature has been lavish in combining many advantages for a large city. Every kind of raw material and product of the farm can be centred here as cheaply as at any other point in the west. Cotton, wool, flax, hemp, tobacco, coal oil, coal, iron ore, all kinds of timber, fine stone, fire-clays, lithographic and marble quarries, are profusely plentiful around Bowling Green as a centre, while the facilities of water carriage and railroads, reaching to all parts of the South and West, are uninterrupted throughout the year. Like other Kentucky cities, surrounded by rich agricultural districts, she is just beginning to develop a few of the many resources at her command. Already there are several mills, factories, distilleries, and machine-shops actively at work; but these are not a tenth part of what are needed to supply the immense trade she might concentrate from all the vast agricultural areas lying south and west along the lines of her railroads and navigable rivers. An infusion of northern or foreign capital and enterprise could here be made to produce most wonderful results in any class of factory business, while wealth would fill the coffers of the skilled laborer and mechanic. The people are intelligent, hospitable, and

refined; the public buildings are very superior, the churches large and commodious, the public and private schools excellent; good water-works, and a healthfulness of location equal to any in the State.

Henderson, a city of some five thousand inhabitants, situated in the county of the same name, on the Ohio, about midway between Louisville and its mouth, has one of the most eligible sites to be found along the banks of this queenly river. Its business, compared with its size, is exceedingly large, owing to the immense amount of tobacco that concentrates at this point. From here and Owensboro are shipped a majority of the strips sold in the English markets. The people are mostly native Kentuckians, and remarkably hospitable, intelligent, and enterprising; the public free schools are probably the best of any similar-sized city in the Western States, and are supported with more pride by the citizens; the public buildings and churches are large and well-built, and everything about the city shows a spirit of thrifty progress towards wealth and population. The manufactories and stemmeries of tobacco are very numerous and well-conducted, giving employment to a large number of laborers and several millions of dollars of capital; other mechanical and manufacturing and milling establishments are being built, and several are now in active operation.

Iron ores, coal, the best of timber, fire-clay, potter's clay, excellent stone, besides every kind of agricultural product, are conveniently to be had; in fact, the city itself is located over a coal field of not less than an average combined thickness of some 35 feet or more.

River navigation and railroad facilities for freight and travel, uninfluenced by cold or heat, connect Henderson with every part of the Mississippi valley, and afford her the means, if properly utilized, in connection with her other advantages, of becoming one of the cheapest manufacturing cities in America.

Owensboro, situated on the Ohio river, 150 miles below Louisville, on a level plain, in one of the richest sections in Kentucky, contains about five thousand people. It is nearly in the centre of the great "Illinois coal field," and is surrounded by every advantage needed to build up and support a large commercial and manufacturing city.

Daviess county, of which Owensboro is the county seat, is one of the richest, most productive, and best timbered counties in the State, and produces as much tobacco as any other county in the United States, with half a dozen exceptions.

Of course this makes Owensboro a large tobacco centre, and employs her population extensively in manufacturing, stemming, and shipping

this staple; other industries, however, have not been neglected, but are springing up and flourishing in this growing, enterprising city; manufactories of various kinds are coming into active operation, and capitalists, influenced by the many natural facilities of the location, are beginning to invest in numerous mechanical and manufacturing employments, all of which will make bountiful returns, no doubt, on the investments.

The population are well educated, generous, and hospitable, and are endowed with a spirit of progressive energy. The public buildings are large and substantially built, the churches numerous and elegant, while the schools, public and private, are first-class in all their arrangements.

With labor and capital to develop the natural resources of the adjacent counties, and to establish new branches of industry within her limits, nothing could prevent Owensboro from being, what nature has destined her, one of the most populous, thriving, and energetic commercial and manufacturing cities on the Ohio river. Nowhere can the seekers for new and profitable homes be better suited than in this enterprising place.

Hopkinsville, a city of about five thousand population, is located on the waters of Little river, in the county of Christian, about the centre of the sub-carboniferous formation, in one of the richest sections of the State, and in the centre of the largest wheat-growing county in the State, and the largest tobacco-raising county in the world. Her population is nearly all of the native Kentucky, Virginia, or North Carolina stock, and are noted for their chivalry, intelligence, hospitality, and industry. One of the best tobacco markets in the West is located at this point, where from ten to twelve thousand hogsheads of tobacco, and that the best shipping leaf on the continent, known as the "Hopkinsville Shippers," "African Shippers," or "Mexican Bailers," are sold yearly on the "Breaks." These sales are all made at auction, the buyers (who are from all parts of the United States and Europe) bidding on the samples drawn from the hogsheads by sworn public inspectors, as is done at Louisville, Kentucky, and at Richmond, Virginia, can see, before they buy, every package uncased and stripped. There are many stemmeries and factories of this important staple, besides several mills, machine shops, factories of carriages, plows, agricultural implements, wood-work, and various other mechanical industries.

The schools, both private and public, are first-class, consisting, besides those teaching the common branches, of several academies and high

schools for both males and females. The public buildings and churches are large and elegantly built, and near the city is the Second Kentucky Lunatic Asylum, which is said, by competent experts, to be the most complete, well-arranged, and successfully managed institution of the kind in the world. The railroad passing north and south through this place connects it directly with the entire southern country, and all the principal cities of the northern States.

The proximity to the western coal fields (to which her system of railroads reaches at less than twenty miles), and the fine timber of Christian and the adjacent counties, together with the vast iron ore deposits of the sub-carboniferous group lying near her, in addition to the tobacco, cotton, wool, wheat, and other agricultural products at her very door, make Hopkinsville one of the most advantageously located places for manufacturing enterprises in the Western States, and will no doubt, in the near future, cause her to rank among the commercial and manufacturing centres of the Union. What she now lacks is more capital and skilled laborers in order to develop her natural resources. Capitalists and immigration, seeking good and pleasant homes, and profitable points for business, would do well to settle here.

Kentucky has scores of other cities and towns, numbering from four thousand population and downward, which are destined in the future to become places of great wealth, commercial and manufacturing importance, and population, which we would like to describe specifically did our space permit; but these, for the present, we must pass over, with the remark that, before fifteen more years pass, several of them will become so large in population as to astonish immigrants who might locate in them now.

LIVE STOCK.

Under this head we include particularly horses, mules, cattle, sheep, goats, hogs, and poultry.

Kentucky seems destined by nature as the place where live stock of all kinds might arrive at the highest perfectability on our globe. Long before the white races had discovered this continent, the aboriginal Indians, by common consent, appropriated the State of Kentucky and a part of Tennessee to be a grand central pastoral park, in which all animals fit for food could graze, fatten, and multiply without limit, in order to supply the wants of the numerous tribes surrounding it with food for winter. The native grasses grew here as they did nowhere else on the continent, and the numerous rivers, creeks, and springs, here afforded the most ample supply of good, fresh, wholesome water at all seasons of the year, not freezing up in winter or drying out in summer.

The native forests here produced acorns, nuts, wild plums, cherries, grapes, persimmons, papaws, haws, and all kinds of small fruits, berries, and grass-nuts, in almost countless varieties and profusion.

The climate was mild and salubrious, and the scenery grand and beautiful. Wild herbage and lovely flowers bedecked the hills and valleys in summer, and the evergreen cane, blue-grass, and native wild rye and oats, gave an abundance of provender in winter. Truly this Heavened-favored spot was the "Garden of Eden" for all kinds of animal life to concentrate and flourish in its native perfection. Accordingly, we find among the remnant of prehistoric animal fossils the largest mammoth bones in the world at Blue Lick Springs and other places, and the bones of the elephant and mastodon in size such as is nowhere else to be found. We also find here the largest skeletons of the bison, the buffalo, the elk, the deer, the wild ox, the antelope, the bear, and other quadrupeds which seem to have disappeared before the country was inhabited by the aboriginal savages. But like causes always produce like effects, and the salubrious climate, succulent grasses, and native nuts, fruits, and berries that caused the super-excellence of these prehistoric animals, continue to stimulate their present domesticated representatives into the most perfect specimens of their kinds on the globe.

When the first settlers came to the State from Virginia and North Carolina, and brought with them their horses, cattle, sheep, hogs, and poultry, they soon discovered that they had come to an Eden for live stock—that here the horse, the cow, the sheep, the hog, the turkey, the duck, the chicken, and other mammals and poultry, thrived and flourished as they had never known them to do elsewhere. This suggested the idea of improving the breeds brought with them over the Allegheny mountains by the laws of selection and adaptability.

The Conestoga stock of horses of Pennsylvania and Virginia were in a few generations changed to the hardy, tough, active stock of Kentucky. Soon importations of the best breeds of Arabian and English horses, and Spanish and Moorish jacks and jennets, were introduced, which clearly showed their superiority, when crossed with our improved natives, to the stock of the older States.

The trials on the turf and the road exhibited the fact that there was something in the food and the water of the "Blue Grass Regions of Kentucky" that gave hardness of bone, fineness of hair, toughness of muscle, and power of lungs, which was not possessed either by the horses or mules of other States. The turf registers began, in the second quarter of this century, to record a majority of races and the best time to Kentucky horses; and now, after a continuous record of about fifty years, Kentucky stands pre-eminent as the acknowledged centre from whence comes the finest and fleetest racers on the American continent, and the best natural blood next to Arabia in the world.

The Kentucky mules also have become equally famous with her horses, and known throughout the entire Union for their great excellence in size, cleanness of limbs, toughness of muscle, power of bodily strength, and endurance of fatigue.

As it is with horses and mules, so has it been with cattle, only more marked. The "Kentucky Short Horns" are known throughout the civilized world, and are sought after by parties seeking to improve their native herds even in England, the mother country of fine cattle, whither are now sent every year some of our finest breeds in order to enrich the noted pedigrees of that country.

Many of our cattle fanciers have for years been searching the best pedigrees in England and Europe to find all the good points needed for milk, butter, cheese, and beef; and whenever they have discovered some point of superior prominence, have imported the stock and ingrafted on our native improved breed, until now it seems almost impossible to

improve further; yet the contest is progressing as if they were determined to advance the cow into some kind of higher grade of mammal. Already immense prices are paid for these select specimens, ranging from \$1,000 to \$40,000, which would seem to our ancestors to be fabulous, and even so with us, were it not that we know and see these trades making every year.

With sheep, too, wonderful improvements have been made by importations, selections, and judicious breedings, until now it is no very uncommon thing to find sheep among our sheep fanciers weighing from 400 to 460 pounds, and shearing fleeces of fine wool of from 25 to 38 pounds. Since the late civil war, a great stimulus in improvements of the breeds of all kinds of stock is going on, and most of the old scrub breeds of sheep are giving way to the Merino, Cotswold, South-down, Shropshiredown, and other highly prized pedigrees. We will here say, by way of parenthesis, that no part of the world probably affords better native and domestic pastures for sheep than Kentucky, and the day is not far distant when the very finest American wools will be most profitably exported from the table-lands of our mountain counties, as well as from different other sections of the State.

Wherever corn, grass, and clover grow to perfection, as it does here, hogs flourish and become a most profitable crop. No part of the world has finer stock of this mammal than is found everywhere in Kentucky. The Berkshire (red and black), the Poland-China, the Chester White, the Woburn, Essex, the "Long Red," &c., are some of the favorite breeds that have been brought to such perfection in taking on muscle and fat, that it is now quite common to see droves, not exceeding ten to twelve months old, average 350 to 400 pounds. All parts of the United States look to Kentucky as the headquarters for fine pedigrees of hogs, and send here to procure breeders.

The breeding of goats for their fleece is a new industry, which bids fair to become quite popular and lucrative in many parts of the State, the greatest drawback being the trouble given by the goat in doing injury to fruit trees.

Poultry raising, although practiced on every farm in the State, has latterly taken a new impetus, owing to the rapid growths of our villages, towns, and cities, the citizens of which require eggs and fowls in greatly increased quantities. The introduction of many foreign breeds of chickens, particularly those of Asiatic origin, has greatly increased the size of the native stock, though we are not so certain that they

have not injured the health of the fowls, and shortened the pro rata profits in eggs. Ducks, geese, guineas, turkeys, pigeons, &c., are largely on the increase, and our Poultry Associations show that the quality of each is improving with every decade of years, both in profits from eggs and size of the bird.

Few domestic rabbits or hares are raised in Kentucky, owing to the great abundance of wild game, which are considered preferable for the table.

The rank which the State has taken as a stock-raising country can never be lost to her, because there are but few places in the world where the grasses are so succulent, the grain so nutritious, and the water so peculiarly adapted to the deposition of the hard solid bone, upon which can be built the physical body of animals, in just such perfection as is done here. By referring to table on page 23 of this book, it will be seen how these same causes act upon the physical development of our human population, and make our soldiers and citizens larger and more muscular than those of any other country.

WHY EMIGRANTS SHOULD SELECT KENTUCKY FOR A HOME.

Daniel Boone, the famous western pioneer, said, in his old age: "I have traveled over many new countries in the great Mississippi valley; I have critically examined their soils; their mineral wealth; their healthful climates; their manufacturing situations; and the commercial advantages given them by nature. I have discovered where these endowments were given most bountifully in many localities, singly and in groups, *but I have never found but one Kentucky—a spot of earth where nature seems to have concentrated all her bounties.*"

So thinks almost every dweller in this highly favored land, and so will feel every emigrant, who, coming from other parts of America, or from Europe, will locate upon our soil. Probably no other portion of the earth of equal size presents to man more inducements for a permanent home, when we consider the value of health; the vigor of mind

and muscle, the richness of soil, the temperate and uniform climate, the number of navigable rivers, the abundance of timber, the rich native grasses and fruits, the vast deposits of coal and mineral ores, and the great facilities for agriculture, commerce, manufactures, and education.

The manners, customs, and habits of a country are influenced to a great extent by the natural conformation of soil, water, timber, scenery, climate, minerals, and vegetable growth. A country, where nature works on a grand scale for man's comforts, naturally responds, by producing a physical development of man commensurate with these superior gifts. Pure air gives strong lungs; rich food gives stout bodies; fine, sparkling water gives solid bones; grand scenery gives noble thoughts, and temperate, uniform climate gives long life. So, too, a bountiful food-producing soil gives hospitality and a generous philanthropy, while poor sterile lands dwarf the kindlier feelings of manhood.

Whenever a sensible man determines to seek a home in a new country, there are, or should be, certain facts regarding the new land which he should know, before he can fix upon the place where he is willing to remove his family, and where he is satisfied that he can better the condition of himself, his wife, and his children, and where they can all live in good health, in peace, contentment, and happiness.

First. He must look to the government, to see that it is free, liberal, and stable; that it is not oppressive in its system of taxation, and that it properly protects the lives, the liberties, and the property of its citizens, and that no castes of favored classes or religious societies control the law-making or law-executing powers.

Upon these points Kentucky makes as fair an exhibit as any other country on the earth, being a central State of the free and popular North American Union of States, acting under its own local laws, made by its own male citizens, every one of whom stands equal in their sovereign capacity as citizens—all voting and all eligible to any office in the land, from the lowest to the highest. Her taxes are only forty cents on the one hundred dollars' worth of property, assessed at a low valuation, of which amount more than half, or twenty-five cents on the hundred dollars, go to the public school fund to pay for the education of the children of the Commonwealth.

There is *not one cent of State debt* more than she has cash in the Treasury, but, on the contrary, she has a surplus of several millions of dollars on hand, now held in trust and invested in interest-bearing bonds and other securities for the benefit of the public schools.

In Kentucky, the child of any immigrant can become, if found worthy, a legislator, a Senator, a State Governor, a member of the United States Congress or Senate, or even President of the United States. Every place of honor and trust, as well as every class of business, and every industry known to man, can here be followed by any citizen, and no religious, sectarian, or family castes stand in his way to preferment or fortune. Even a non-resident alien can acquire real estate in Kentucky by descent or devise, and can hold, sell, alienate, or convey the same, as if he or she were a citizen of the United States; but the time during which such alien may thus hold, sell, convey, or alienate such estate, expires eight years from the time of the final settlement of the decedent's estate. Other laws, liberal and philanthropic in their operations, have been long in operation, so as to give to all men, of all nationalities, every possible right which justice and circumstances can admit.

Second. The immigrant should seek for good soil, good water, and a healthy climate. In these three requirements no part of the North American continent can excel our State, as will become evident to any one who has attentively read the foregoing pages, and will look at the geological and geographical position of the country, and who will study the structure of soils that originate from the formations which are prevalent in this portion of the continent. The lowest formation that comes to the surface in this State is the Lower Silurian, with its rich deposits of shelly limestones and marly stratifications, deposited at a very early period among the sedimentary rocks; above this we find every other group (including such immense beds of iron ore and coal as are to be found on no other spot of equal size), until we arrive at the Tertiary and Quaternary, that are even now in the act of formation. Of course, then, every variety of soil and water that usually accompany these stratifications exist in this State, dependent upon the locality of the various underlying rocks. The climate, too, is exceptionally good—among the best of climates, even of the north temperate zone, in countries of parallel latitudes. The climate is about such as is found in France and Germany in Europe, or in parts of China and Asia.

Third. The immigrant wants good society and good schools. Society is an outgrowth of conditions. A free people, good laws, rich lands, a healthy climate, and easy means of travel, always make good society, and produce a high order of intelligence, that builds up a civilization that cannot be circumscribed by prejudices or religious fanaticisms. These conditions exist in a marked degree of perfection in this

State; therefore "Kentucky chivalry" and "Kentucky hospitality" are known wherever the English language is spoken, and the frank, genial, proud, generous, and hospitable bearing of our people is as "native to the manor born" as are the stout, robust physical bodies that make our people fear no danger and shrink from no labor or responsibility.

Our public free school system is working well, and the school-houses are, in every neighborhood, easy of access to all the minor children in the State. High schools, seminaries, academies, and colleges are scattered throughout the Commonwealth, so that every one desirous of obtaining a higher grade of education can do so here as cheaply and as thoroughly as in any other part of the world. Every denomination of Christian churches are also scattered throughout the various counties, supported each by its own members, and not by the State.

Fourth. The immigrant wants good markets and easy facilities for travel and transportation. An examination of the maps will show that we have a larger number of navigable rivers and turnpike roads than any other State in the American Union, and a system of railroads that now penetrates every section of the country, and that new roads are building which will, before many years, reach every neighborhood, and this, too, as soon as the demands of the country require. In markets, we have our own large cities and towns as commercial points, besides close connection by water and railway communication with all the towns and cities of the other States of this continent and Europe.

Fifth. The manufacturer, the mechanic, or the merchant, before he emigrates, wishes to know whether the field is suitable for his special industry. To satisfy him, look at the rich mineral ores, greater in quantity than they are in Pennsylvania, England, France, or any of the German States; the fine timber, the ample supply of food, and the bountiful supply of every raw material grown from the earth; the temperate climate; the salubrious atmosphere; the cheap fuel, both from wood and coal; the immense water-power of our rivers, and the easy and free communication with the rest of the world, and then say, upon what other spot on earth can you find more advantages for the employment of mechanical and manufacturing labor, brain-work, or capital, than here in Kentucky. Here is room amply sufficient to give work to the single laborer, or the largest association of concentrated capital, without fear of exhausting the supply of the raw materials. The labors of the merchant and the professional man follow those of the agriculturalist, the

mechanic, and the manufacturer; and where these are successful, there commerce and the professions prosper.

These and many other advantages are offered by Kentucky to persons seeking new homes in the Mississippi Valley, who are invited to come and settle among us, and to share with us the great benefits arising from the immense resources of our State; and, as Kentuckians, we offer a hospitable reception to all, whether natives of America or Europe, who may be willing to immigrate and stay with us.

INSTRUCTIONS TO EMIGRANTS.

On account of the impositions of many hotel-runners, railroad drummers, and "confidence men," who are ever ready to deceive and swindle the unsuspecting traveler, we will here give a few instructions to emigrants seeking homes in Kentucky.

In removing from any one of the United States to this State, a person can buy through tickets to all the principal towns in the State from any leading railroad or steamboat line. It is best to get these through tickets to the nearest possible point to the place you are going; from this point you will have no difficulty in getting to the place desired, either by public or private conveyance.

The great trouble to those coming from Europe, especially when they cannot speak the English language with fluency, is, that, on landing in New York or elsewhere, from aboard of ships, they will be met by sharpers, who will, under pretense of assistance, overcharge, misdirect, delay, mislead, and swindle the unsuspecting emigrant out of all his money.

It is best in a strange city not to make friends with, or listen to the advice of, or accept assistance from, any person unknown to the emigrant, unless he is satisfied that such person is regularly connected with the Commission of Emigration. In case an emigrant has acquaintances in the city at which he lands, it is best to go to them and get posted regarding his contemplated journey.

If, however, he lands in New York, where more than three fourths of the emigrants do land, then he will find some one at the "Office of Commissioner of Emigration," at Castle Garden, who will start him properly on his journey westward.

There are some of the steamship lines from Europe that sell through tickets to Louisville, Kentucky. In case you buy these tickets, you will have no difficulty at all in reaching your destination, according to the tenor and instructions printed on the tickets.

Mr. J. D. O'Leary, a reliable agent at Louisville, Kentucky, of steamship lines, gives the following excellent advice to emigrants coming West: "Castle Garden, New York, the chief landing place for emigrants in the United States, is constituted under the laws of the State of New York, and supported by a commutation tax of about \$1 50 on each emigrant arriving at that port, and the benefits accruing to emigrants are their *right, not a favor*, as many suppose; for this tax is included in cost of passage. The managers are styled 'Commissioners of Emigration.' The amount of tax is about \$500,000 annually. The business at Castle Garden is divided into bureaux, each having an officer in charge. The chief railroads have their representatives to direct the emigrant, who, *secure against improper influences, may begin from the wharf at Castle Garden his journey to any part of the United States.*

"The Information, Landing, and Forwarding Bureaux conduct correspondence and telegrams, receive remittances intended to defray expenses of the emigrants, and conduct their departure for the interior in safety and dispatch. A Medical Bureau, in charge of the hospital, has care of the sick, and when convalescent, sends them to their destination. The hospital is visited by the Irish and German societies. Stringent police regulations protect the emigrant at Castle Garden; runners and boarding-house keepers are excluded from the premises.

"There are two points to be observed by emigrants, that would relieve themselves and friends of much anxiety, viz:

"1st. As soon as the emigrant has decided on the date of departure from Europe, and has ascertained the name of the ship, which he will do eight days previously through the agent, he should communicate the facts to his friends in America. The latter can ascertain, through the American local agent, when any given ship has landed.

"2d. By requesting the telegraph operator at 'Forwarding Bureau,' Castle Garden, to send a dispatch (by *night line*, at half rates) to his friends in the interior of the hour of departure by railroad to his destination.

AGRICULTURE A SCIENCE.

In the earliest periods of man's history on earth, if we can judge from the stone implements of war, and the bronze articles used for every purpose, found in caves, lakes, and the earth hills, very little soil tillage was carried on. Hunting, fishing, and fighting were the chief employments. The wild fruits of the forest, the roots, the bark of trees, and herbs and berries, were the only vegetables which nature voluntarily furnished as food for man.

There was then but little cookery and less manufacturing. Simple in mind, and ignorant of luxuries, the human family seems to have existed in a state of savage barbarism, typical of the lowest development. The advance from this primitive condition was slow, gradual, and only perceptible in long eras of time. From barbarism, the advance first brought the race to the nomadic, then to the pastoral life, when they seem to have domesticated a large number of wild beasts, and began to make clothing of their skins; another advance brought them to domesticating some of the wild grasses for the use of the domestic animals, and some vegetables and cereals for their own consumption. Then began the regular cultivation of a few crops, on a small scale, and in a very imperfect style. But the progress up to this time was immensely ahead of the original barbarism of the prehistoric tribes which used the flint rocks and bronze axes. Crop cultivation soon created a necessity for iron implements. When these were invented, man began to look to a higher civilization, and to seek a more extensive domain of food production. Generation after generation would follow with but little advancement, owing to the wars, fanaticisms of religious superstitions, and the general ignorance of the race. The standard of progress during all these long periods was marked by the advancement in food production or agriculture. The countries lying around the base of the central mountains in Asia, embracing parts of China, India, and Persia, were in all probability the places where the earliest advancements towards civilization were made, and where agriculture first began its developments. At this early period much of the American continent, if not covered with the ocean, was probably inhabited only by the immense mammoths, and other animals, mostly now extinct. The rudest implements were

used in the soil tillage for centuries after man had progressed out of the savage state, and but little surplusage of any food articles were produced. By little and little, as the race progressed, surplus stocks of food, and tame animals and materials for clothing, would accumulate, and this caused the tribes to begin exchanges, which were the first germs of commerce. The products of agriculture also necessitated the art of handicraft working or manufactures. At first, all classes of manufacturing were very simple, and extended only to the present wants of the workers; but, by degrees, the minds of men were expanded by continual cultivation of the soil, making of rude articles, and traffic, until the races ceased to be nomadic, and became settled into regular permanent communities. Now, with this new condition of permanency, began improvements in soil tillage. These were followed by improvements in manufactures, and a general movement towards a division of the labors necessary to different classes of industries. This led to building villages, towns, and cities, and a system of regular traffic between them. Then began, too, in the multiplied subdivision of labor, the cultivation of the arts and sciences, and with them, an improvement in everything that tended to give man luxuries and wealth. But, during all this time, agriculture held the foremost rank as a business, and gave employment to the great mass of the people. No tribe or nation advanced in the arts, sciences, or power faster than the progress in soil tillage could give cheapened food and comfortable clothing. Occasionally, by reverses in war, the agricultural interests of some nation would be seriously injured or destroyed, when straightway a decadence or retrogression would take place with the entire population, and a recovery would never occur until agriculture had again recovered its leading position. The practical soil-tillers then were only governed in their planting, cultivation, and harvests by the experience of past years, and never, by following a theory, discovered the causes upon which they were successful in their labor, but went forward, making advancements in methods of tillage, the preservation of lands, and improvements in agricultural implements, at a snail's pace, until they had passed the mediæval ages, and until after the revival of letters, consequent upon the discovery of the art of printing. Then the sciences for the first time began to attach themselves to the every-day industries of men, and to greatly expand the human intellect, by preserving for its use, in printed shape, the pioneer thoughts and experiments of great intellects upon every subject.

The isolated position of the planter, however, caused him to be the last to accept of the general progress, and to attach the truths of nature, discovered by the scientific investigators, to the industry of agriculture; for this did not fully happen until the beginning of the present century in either Europe or America. Professors Sprengel and Leibig, in Germany, and Sir Humphrey Davy and Johnson, in England, first spoke of agriculture as a science, and placed it in connection with the sciences of chemistry, geology, and meteorology. They taught that the elements of plant food must be supplied to the soil before the plants could flourish, and that the doctrine of Von Humboldt, viz: that everything was governed by unalterable laws, was as applicable to the products of the farm as it was to the worlds of the planetary system. The books they wrote, and the addresses they made, drew the attention of educated men to the subject, and caused the Governments of Germany, France, and England to create Bureaux of Agriculture, and establish experimental farms, where scientific applications could be tried and chemical analyses could be made upon all classes of soils, vegetable growth, and elementary plant food, which art could furnish as fertilizers. More latterly the same plans have been adopted in several of the United States, and the results of their experiments published to the world. The effect has been a most wonderful advancement in the science of soil tillage, an improvement in all classes of agricultural implements, as well as in cereals, vegetables, and plants, and a development of a higher grade of every kind of live stock used by man, either for food, ornament, or burden.

As yet, in this day of our enlightened civilization, comparatively but few agriculturists pursue their calling as a science, but continue to strike in the dark, or else go along the old beaten paths marked out by the past experiences of their forefathers, aiming to accomplish by main strength and awkwardness what could be much more easily done if they would use the experience gained from a knowledge of the laws of nature, as applicable to the soils, to the vegetation, and to the animal economy of live stock. But *agriculture is a science*, with laws as fixed and determinate as are those of navigation, astronomy, chemistry, oratory, or legal jurisprudence; and *this science*, to be thoroughly understood and carried on, requires as high an order and great a variety of talents as does law, medicine, theology, or mercantile pursuits. *All sciences* are connected in one grand trunk, and form but the branches of the *Tree of Knowledge*. The real science of agriculture presupposes a knowledge of the kindred sciences of geology, meteorology, zoology,

biology, hygiene, botany, &c., &c., and no man can be a practical scientific planter who is entirely ignorant of any one of these kindred branches. Fortunately most farmers catch more or less of the practical parts of these sciences, without knowing what they are, and without suspecting the extent of their scientific attainment. Often a farmer, who cannot even read or write his name, will be able to judge, correctly and geologically, rich from poor lands; has the general run of the climate and other meteorological phenomena; knows the order, genus, and family of horses, cattle, sheep, swine, poultry, bees, and other living animals and insects, with a good idea how to breed, cross pedigrees, improve bloods, keep in healthiness, fatten, and cause to prosper every kind of live stock with which he is brought in contact. He also is botanist sufficient to know the best seeds of all kinds of cereals, grasses, plants, fruits, vines, and vegetables cultivated in the country in which he lives. By close observation and study of the open works on botany, which are every day spread before him in the fields and forests by nature, he is enabled to thoroughly comprehend the best methods of planting, cultivating, harvesting, and preparing for use or market all these productions of the farm. He may be ignorant of the causes that produce results, just as the philosophers or scientists are *ignorant of all things unknowable*, or that appertain to the infinite, either of time, space, power, beginning of things, or conception; yet the facts he knows will answer his purposes, so far as they go, and thus far he certainly is a scientific farmer. But he should go on learning the laws of nature that govern other branches of his occupation. He should learn the chemical constituents of his fields, and the elements contained in his crops, in order that he may know whether he can grow to perfection the cereals or plants which are to produce his harvest, and so that, if any of the elements of the crops are lacking in the soil, he can supply them from external sources in such quantities as are needed.

Science must also teach him how to properly pulverize the dirt, so as to admit light, heat, and moisture, as the same may be useful to the plants, or necessary to the proper dissolving of the mineral particles of the soil. Truth can always be theoretically proved and explained. This he should learn, and bring it into practice in every branch of agriculture. The brain-work is as necessary as hand-work, and will always be found more profitable. The big-brained, thinking, planning, experimenting farmer is always learning, always testing, always proving his truthful theories by practice, which is nothing more or less than testing, by experiments,

his own ideas of what are *natural laws* and their actions under certain conditions and surroundings. *The science of agriculture* exhibits more phenomenal phases than probably any other branch of science, not even excepting chemistry, and the farmers have a field for observation as much wider than that of the pent-up chemists as the farm is larger than the laboratory; in fact, the whole farm is nothing but a laboratory, where nature is the head chemist, always making and unmaking every conceivable form of physical composition, and showing in every stage of development, from the infinitesimal germ upwards, the progress of all things in the vegetable and animal life, in their allied connection with the mineralogical and geological conditions accompanying them. Apart from profit, and merely as a pastime or a school for scientific teachings, agriculture excels all other employments, and gives wider range for experiments, and a greater variety of points for investigation, than any calling in which man can possibly engage his time or his talents. The excellence, the importance, and the beauty of *agricultural science*, has never been duly appreciated by its followers, and therefore it has not made such noticeable strides as have its kindred sciences—astronomy, mathematics, and geology—yet the progress is very great, and every year the volume of facts made known are increasing, and will eventually place this in the front rank of all human studies, and among the most honorable callings and profitable pursuits which a man can follow. When this is the case, the *certainty* of crop-raising and the knowledge of the economy of animal life, will make farming a pleasure rather than a toil, and will place the highly educated, practical farmer at the head of the scientific men of the world. Every year now is pushing us forward to this goal, and the position taken by Massachusetts, Georgia, Tennessee, Kentucky, and other sister States, is a move in the right direction to produce this result. An advance in soil tillage produces an advancement in civilization, and tends to hasten the time spoken of by the greatest of philanthropists, who foretold of the days when the sword should be turned into the pruning-hook, and nations should know war no more.

We hope every farmer in the land may look truly, philosophically, and scientifically to the noble industry in which he is engaged, and learn to sow his seed, cultivate his crops, gather his harvest, fertilize his land, and preserve his timber and soils upon scientific principles. And while he helps to feed and clothe his brethren of all other callings, he may so use the fields he now owns that his descendants in future generations

may find them improved by his skill rather than impoverished by his ignorance and neglect.

In an appendix to the Geological Survey of Dr. Owen, Prof. Robert Peter, the celebrated analytical and agricultural chemist, says: "The study of the *science* of agriculture is becoming more and more important, as the good lands of our country become gradually deteriorated by a thriftless husbandry, or as the poorer lands are brought into cultivation. Whilst the country is new, and the soil so rich that successive cropping for a number of years causes no very sensible diminution of its products, it cannot be expected that the farmer will care much or know much of those essential elements, resident in the soil, without which no plant can grow or mature its seed; but the time will inevitably come when this subject will be forced upon the attention of the agriculturist and the political economist, and the study of the *science* of the cultivation of the soil will become a first necessity. It is the part of a wise and provident man, or nation, to look at and provide for future contingencies, and it is not too soon now to begin the work of the ascertainment and diffusion of this kind of knowledge. Already some of our richest soil in the Blue Grass Region shows, by chemical analysis, evident signs of partial loss of the indispensable ingredients of its fertility.

"The idea that the soil is inexhaustible—a bank on which we may draw forever without precaution—is held at present by very few *theoretically*, although *practically* the great majority of our farmers seem to entertain it, and act upon it without scruple. The positive facts, which have been ascertained by chemical analysis, in relation to the elements of plants, and of organic beings generally, are gradually becoming known to the masses, and, by the improvement of the common education of the people, we may hope that this knowledge, so important to agriculture and the arts generally, will be more widely diffused.

"It is demonstrated, by general experience in the laboratory, that no vegetable, the most minute, can grow, no microscopic vegetable cell, in short, can be formed, without the assistance of certain mineral substances, always to be found in fertile soils; and that whilst the greatest proportion of the weight of vegetable and other organic bodies, composed of carbon, hydrogen, nitrogen, and oxygen, may be derived from the gases of the atmosphere and from water, the *fixed materials* always found in their ashes, drawn from the soil by the living plant, are equally essential to vegetable growth. In the absence of these,

whatever may be the abundance of the atmospheric elements, vegetable developments would be impossible; even the absence of one or more of them would prove an insuperable obstacle to growth.

“As the atmospheric elements are everywhere abundant, these *fixed elements*, existing in the soil and in the surface water, are more especially worthy the attention of agriculturists in all parts of the world. It was the removal of these, or of some of them, by successive exhausting crops of corn, tobacco, &c., which caused the reduction of much of the soil of Virginia from a state of high fertility to one of almost hopeless sterility; as, on another continent, the constant exportation of grain has rendered worthless countries which formerly were the granaries of Europe; a spendthrift system which, if long continued, will, in the course of time, bring even the rich prairies of the West to the condition of sunburnt deserts.

“In order justly to appreciate the value of the mineral ingredients of vegetables, the reader, having acquired some knowledge of elementary chemistry, may consult some of the recent valuable publications on the chemistry of agriculture; none, perhaps, would be more satisfactory than the ‘*Lectures on the Applications of Chemistry and Geology to Agriculture*, by Jas. F. Johnston;’ republished in this country by Wiley & Putnam; and there are other good works on these subjects, of more recent publication, easily accessible.

“The examination, by chemical analysis, of the ashes of plants in which these mineral ingredients are always found in their natural proportions, enables us to appreciate fully their value in the economy of organic nature. In no plant or part of vegetable tissue are they absent. Usually, all are present in every plant; they vary in their relative proportions in different vegetables, and even in different parts of the same vegetable—some plants requiring for their healthy growth more potash, some more soda, lime, oxide of iron, silica, or phosphates than others. A soil which contains them in all sufficient abundance is a fertile soil; and one from which they are entirely absent is hopelessly sterile until they are supplied. These important elements of vegetable nourishment are potash, soda, lime, magnesia, oxide of iron, oxide of manganese, phosphorus or phosphoric acid, sulphur or sulphuric acid, chlorine, silica, and a few others found in minuter proportions. These exist in various states of combination in the fertile soil, and in relatively small proportion, except the silica, in particular, which forms the greatest weight of all soils, but in the insoluble state of sand, in various degrees of fineness. They are all dissolved, in notable quantity, by the water

which falls from the atmosphere, principally by the aid of carbonic acid, which it always contains, and partly by the organic acids resulting from the decomposition of animal and vegetable substances in the soil. The operation employed in the analyses of the soils given in the present report, by digesting them in water containing carbonic acid, always showed the solution of a considerable quantity of these nutritious mineral ingredients, and exemplified the mode in which these substances, generally little soluble in pure water, are naturally dissolved and made available for vegetable nourishment."

This article we quote at length to show the substances needed for plant food, and also what an advanced mind thinks of the science of soil tillage, and its vast bearing on the future economic productions of the necessary articles of food and raiment for the human family. In the establishment of a true theory and practice in agriculture, scientific research and practical plant-raising must go hand in hand. Science may suggest to the educated brain, but practice must prove. Chemical analyses of soils, plants, and fertilizers must be combined with the closest and most accurate observations on the seeding, culture, and harvesting of various crops, under different circumstances and conditions of soils, manures, rainfall, heat, light, &c., &c. In past ages the world has stumbled into improvements, and formed a tolerably correct system of agriculture from empirical experiments, unaided by scientific researches; but these have necessarily been tedious, long tested, and uncertain, and, while answering for new lands, which could bear with wasteful culture, could not be relied upon as bases of demonstrative facts. It is only when scientific investigations are conducted with a careful measurement of the elementary constituents and known conditions of climacteric influences, that a true reliable agricultural theory can be established. No science requires more exact manipulations than soil culture, and nowhere, as we have before stated, will man be able to employ his talents more pleasantly and profitably. Then let us say to the educated young farmers of our country, hold on to the calling of your fathers, and become scientific agriculturists.

GRASSES AND MEADOWS.

Kentucky is the land of grasses, clover, and cereals. When first discovered, she presented a natural pasturage that attracted all kinds of grazing wild animals in almost fabulous numbers. The indigenous grasses and vines were everywhere to be found in most luxuriant profusion. The vast herds of buffaloes, deer, elk, antelope, &c., that once roamed over the State, found here the kinds of food most congenial to their perfect development. Some of these grasses have been domesticated; others have died out or are fast yielding to the domesticated varieties.

We will mention some of the most prominent, both of the indigenous and domesticated kinds:

The Pea Vine.—This was once universal throughout the State, and is still quite thickly set in the thinly settled sections, where it has not been eat out by superabundance of stock. It is a vine, as its name indicates, very tender and succulent, somewhat like the common cow-pea, but of a much better flavor for cattle, and is preferred by them to almost any of the grasses during the spring and summer months. Late in the summer it produces a pea in a small pod, upon which cattle, hogs, wild turkeys, and all kinds of game feed and become very fat. This plant has never been domesticated or improved by cultivation. It seems strange that some person has not experimented on it and brought it into notice among the provender crops of the country. In the early settlement of the country, the hunters would trail deer, buffalo, and horses by their tracks through the wild pea vines.

The Barren Grass.—This is a perennial, and once grew on all the "barren" or prairie lands of the State. It springs up early in April, and grows rapidly; it is very tender when young, and greatly beliked by all classes of grazing animals. When fully grown, it is from two to six feet high on rich lands, and becomes quite hard, woody, and coarse as it begins to dry in the latter part of the summer or early fall. It will not stand heavy tramping, and is easily killed out by timber. This grass is the chief food of the great prairie fires that have been so often described by the pen of graphic writers in their travels over the western prairies.

Crab-grass.—This is a native annual, and grows throughout the Mississippi valley. It seems to be ubiquitous, and ready to spring up at

every season of the year, from early spring till late in the fall. A more troublesome pest never received the execrations of the farmer, although when young, and until after maturity, it is exceedingly tender and nutritious, and all kinds of stock fatten freely upon it. It grows most luxuriantly in corn-fields, and among the aftermath of any of the cereals. The hay, when well harvested, is good, and eagerly sought for by horses, mules, and cattle. Where clover or other grasses lie in meadow, the crab-grass soon disappears, but will instantly re-appear when an arable cultivation is renewed. We would never advise any farmer to attempt the domestication of this grass, but, on the contrary, to do all in his power to keep it from choking out his corn, tobacco, cotton, and other crops.

White Clover.—In all parts of the State this is an indigenous plant, of most luxuriant growth. It flourishes best on limestone lands, and produces large crops of seed, and affords excellent grazing for all kinds of stock. It salivates very freely horses and mules, but seems not to affect other animals. Bees are fond of gathering honey from the blooms, which last longer than on any other flowering plant, and yield largest quantities of choice honey. Upon the Upper Silurian and Devonian formations, white clover is a valuable forerunner of herds-grass or blue-grass. If sown with blue-grass, on woodland lots, it takes immediate possession, and keeps off all other grasses until the catch of the blue-grass becomes perfect, when it yields to the greater tenacity of the latter. Being quite hardy, it withstands dry weather and heavy grazing better than any of the trefoil family of plants.

Kentucky Blue-grass.—This is the *king* of all the grasses in a large portion of the State, and is the source of a great part of the wealth of the central and northern counties. It is perennial, and grows to perfection on all lands based upon the Silurian rocks; those counties located on the Devonian shale, Waverly, and coal measures produce fair blue-grass pastures, but not first-class. The sub-carboniferous or cavernous limestone lands are based on a clay too hard and compact for this favorite; consequently, while it grows most luxuriantly during wet seasons, it will die out during the hot, dry weather of August and September. Possibly tile drainage, by rendering the subsoil more porous, would greatly benefit the growth of this grass. This has been the experience in parts of Ohio and New York, and a thorough trial might prove its efficacy on the "barrens of Kentucky." When lands have once become well sodded with blue-grass it will bear sunshine, shade,

cold, heat, wet and dry weather, and always maintain its excellency for grazing meadows over any other pastures. The rents paid for such pasturage per acre in the "Blue Grass Region" proper is equal to the money value of the largest corn yield in many of the Western States. Pastures of fifty years' standing are still good, and the sod perfect where care is taken by the land-owner. No grass, other than the Bermuda, will probably protect lands from washing better than this, or better preserve the natural richness of the soil. Some recent writers affirm that blue-grass is not a native of Kentucky, but that it was brought to Bath and other counties from the Eastern States. This theory is probably erroneous, as it appeared simultaneously all through the Western States, wherever the ground was tramped, upon all the limestone formations, particularly the blue limestone. A better theory is to say that it is an indigenous growth in all limestone countries, either in America or Europe, between the thirty-fourth and forty-fifth parallels of north latitude, but that it is peculiarly adapted to the rich marly blue limestone of the Lower Silurian group in Kentucky. Nature never intended such a boon as the *Kentucky blue-grass* for any one country, as is proven by its growth on so many soils and in so many climates.

Redtop or Herds-grass.—This is a hardy perennial, very superior for wet or bottom lands, either for hay, meadows, or pastures. It makes a deep, tough sod, that lasts well. Sandy loamy soils suit this grass best, although it grows well on any other lands that will grow grass at all. From one to two tons of hay is the extent of its cutting capacity per acre, and, if mixed with timothy when sown, probably no hay is superior. It is not a good grass to sow in connection with clover or orchard grass, as it will choke them out before they are properly set; but it adds much to the timothy meadow, and will "catch" on land where the seeds of timothy take root with difficulty. Redtop makes a good sod to prevent the washing of banks or creek bottoms, or even on hills, and can be made to grow on poor red lands if properly nursed and covered lightly with straw.

Millet and Hungarian Grass.—These grasses, of which there are several sub-varieties, are all annuals, heavy feeders, and luxuriant growers. They grow best on limestone lands, but will do well upon any other good soils in the State. When sown early and on strong land, they produce very large crops of good coarse hay, which is very palatable to horses, mules, and cows. They produce large quantities of seed, which will shatter badly unless the grass is cut before the seeds are entirely

ripe. For provender they may be sown early or late; but early sowing always insures the heavier crop. These grasses have been a great blessing to the farmers of Kentucky since the demoralization of the labor system subsequent to the civil war, by affording them hay when their meadows and oat crops were either failures or unavailable. Any crop which draws so much plant food from the earth in such a short time necessarily is more exhaustive than slow-growing plants; but these grasses take from the soil those elements that can be easily and cheaply restored, either through the barnyard manures or chemical fertilizers.

Orchard-grass.—Next to blue-grass this may be reckoned the most useful to the farmers if we make the single exception of red clover. Orchard-grass grows in this latitude well on all kinds of land after it once gets a set. It is a perennial plant that grows in tufts, and never spreads from the roots as do most other grasses; therefore, it becomes necessary to sow the seed *very thick* in order to insure a good stand. Two bushels to the acre are as few seed as ought ever to be sown, and even then a few timothy or red clover seed might be added to fill up any vacant gaps that may occur between the tufts. The hay from this grass is first-class and very nutritious for all kinds of stock. For grazing some even prefer it to blue-grass, unless the latter is on the best of grass lands. Orchard-grass stands close grazing and heavy tramping, and will carry as much stock as any other grass on similar land. It is very fine for milk cows, colts, and mules; and, owing to its great strength, will largely supply the use of corn in fattening stock. Too much cannot easily be said in its favor as a general average grass crop for our State.

Timothy.—This is a most valuable perennial grass, both for pasturage and hay-making. In fact, it stands at the head of the list for hay. It grows best on limestone soils, but will do well on any good lands in the latitude of Kentucky. Mixed with blue grass, clover, orchard-grass, or alone, it does well, and seems to improve any soil on which it is sown by its capacity of feeding from the atmosphere and carrying the elements drawn therefrom to the soil. From two to three tons of mixed timothy and clover or orchard-grass hay can be taken from an acre of well-fertilized land or rich bottoms, which will command the highest price in the markets. Stable manure spread over timothy meadows greatly increases the yield on almost any class of land, and chemical fertilizers, in several of the Northern States, have been used in the same way with marked success and profit.

Red Clover.—For many purposes this is the most useful and valuable of all the grasses. To enumerate and illustrate all the advantages of red clover would take more space than we can spare in this report. It is a biennial plant, and grows well in every county in the State. There are two main varieties: the large or “sapling clover” and the common red. Each are great fertilizers of land, and will make any land productive on which they obtain a good stand for a few years. The “sapling” variety grows so rank on good limestone soil that it is apt to fall flat and destroy its own stand by overshadowing the roots; on thin lands or sandy soils it does better, and is a good crop for grazing, hay, and fertilization. The common red clover grows most luxuriantly on any moderately good land, and will, if given a top dressing of land plaster and bone dust, where there is a deficiency of lime, produce wonderful crops. The plant feeds mainly from the atmosphere, and returns, by its tap-root (which frequently penetrates from one to three feet in the earth), a large amount of plant food to the soil. As a green crop, turned under with a large plow, clover has probably no superior (unless it is the cow-pea), and if lime is scattered over the land before the plowing, a still greater beneficial result will be observable. Properly managed in rotation of crops, clover will never run out after a crop has once gone to seed in the late summer or fall, and been plowed in. The seed in the ground will remain for years and then vegetate and grow, whenever brought to the surface with the plow. Clover hay by itself is excellent; but the general experience of farmers is, that clover and timothy mixed make a hay of unsurpassed richness. This mixed hay cures well, is easily handled, very nutritious, probably more so than either grass by itself, and will keep perfectly sound in stacks or barns for any reasonable period of time. Our best farmers, in fixing the rotation of their crops, nearly always make clover a leading staple, both as a hay-producer and fertilizer, and usually allow it two years in the routine. In this latitude experience has proven that where there are not permanent blue-grass pastures there should always be one third to one half of the land in good clover fields, to make the farm pay the highest profit.

Alfalfa and Lucern.—This is a leguminous perennial plant, somewhat resembling clover, but very different in its habits. It grows well in almost any loose, mellow soil, where the clay is not too hard. Unlike clover, when it is once well set it will not die out at all if well managed; but, running its roots from two to ten feet in the ground, it acts as a sub-soiler and fertilizer, and carries the ingredients of plant food which it

gathers from the atmosphere deep into the soil. It endures the hottest, driest weather without injury, and will appear green when everything else is scorched up by heat and drought. It will bear cutting much oftener than clover, and produces much larger yields of provender. On the lands west of the Tennessee river, in Kentucky, this plant would be invaluable, and, when once well set, make the best pastures, fertilizer, and hay meadows that could be found in the country. It is a native of Southern Europe, where it is highly esteemed. It was carried to South America by the Spaniards, and from thence to California, where it is extensively cultivated. There are several sub-varieties of the plant, called Chili clover, alfalfa, &c , &c. Very little lucern has ever been cultivated in Kentucky, and that has generally proved a failure, owing to its being sown broadcast, like clover, on a stiff clay soil. A deep, mellow subsoil is indispensable to its successful cultivation, so as to allow the roots to penetrate deeply into the ground. It is best to sow it in drills (although broadcast will do), and keep it clear of grass the first year, after that, it will take care of itself, and spread over all the land like clover. The soil must be thoroughly pulverized and prepared by clean tillage, and the seed sown in quantities about twice as thick as clover. The best time for sowing is in the spring. In the States of Illinois and Indiana it grows with remarkable luxuriance, attaining the height of from two to four feet. A practical California planter, speaking of this plant, says: "When properly managed, the number of cattle which can be kept in good condition on one acre of lucern, during the whole season, exceeds belief. It is no sooner mown than it pushes out fresh shoots; and, wonderful as the growth of clover is, in a field that has been recently mown, that of lucern is far more rapid. It will last for many years, shooting its roots (tough and fibrous almost as those of licorice) downwards, seeking nourishment, till they are almost out of the reach of drought. In the driest and most sultry weather, when every blade of grass droops for want of moisture, lucern holds up its stem fresh and green as in the genial spring." We hope that many of our farmers will try this excellent grass on the right kind of soil, and report to the State Bureau of Agriculture

Italian Rye Grass.—This grass is a native of the lowlands of Southern Europe, and, when sown on the right kind of soil, is unrivaled in luxuriance. All stock love it, either in the green state or as hay. It loses less in weight, in curing into hay, than any other grass. Mr. Lawson, who introduced this grass into England, states that its growth

is so rank that, if sown with clover, timothy, or lucern, it will choke them out. It casts its roots very deep into the soil, and will, therefore, stand drought better than any known grass except lucern. It comes very early to maturity, and reproduces rapidly after cutting, and when used for pasturage, it is so greedily devoured by all kinds of stock that its stems are never allowed to ripen and wither like other grasses. It is, however, not a perennial, but has to be sown every year, or else allowed to go to seed, and then, if re harrowed early in the spring, will produce a most excellent crop. Being a hardy plant, it stands well both wet and dry seasons; and, if plowed under in a green state, is a good fertilizer. Like the millets, it is a cheap and excellent grass for hay, flourishes well as far north as Canada, and yields several tons of provender to the acre. It would be a great acquisition to the river and creek bottoms or rich level lands of our State, and we hope will receive due attention from our farmers.

Burmuda Grass.—This is a jointed running grass, and, like the Guinea grass, is a native of Africa, from whence it was brought to the West Indies, and thence to the United States. The Burmuda flourishes well in Kentucky, and, when it once gets a start, will even eat out the blue-grass. It never comes to seed in this climate, but propagates itself by roots and runners, and in a few years will spread extensively. It has a very tough sod, and is excellent to prevent washing on hill-sides, levees, &c. Sheep are particularly fond of it, but other stock prefer other grasses. We cannot advise its propagation in our State in preference to other grasses, except to stop washings of land.

Other Grasses.—There are many other varieties of grasses which we might describe, but it would take up too much of the space allotted to this branch of our report to do so; therefore, we close this interesting subject by stating that the grass and hay crop is “the king,” not cotton or tobacco, on the farms of the United States, and that the value of this product reaches the amazing sum annually of over \$700,000,000. New York alone has a hay crop worth over \$80,000,000, Illinois over \$25,000,000, and in Kentucky the grass and clover are the “bonanza” from whence comes her greatest wealth.

FERTILIZATION AND PRESERVATION OF SOILS.

The present MAN is but a sojourner on this earth. The soil belongs to him, not in perpetuity, but only for his generation. He has no rights except to its immediate possession and cultivation. The next generation is the real heirs of inheritance, and have a right to demand its delivery to them in as good or better condition than it was when delivered into the possession of their ancestors, and so on forever. Then it is not only *wrong* but *sinful* in us to injure, by injudicious culture, the soil that is lent to us, as it were, but for a day. If we suffer the soil to become poorer, the surface to become unfit for cultivation by reason of washing rains and shallow plowings, or wantonly waste the trees, destroy their fruitfulness, dry up the streams, or neglect the necessary developments of the arable lands, then we are unworthy of the appellation of "good and faithful servants." The *preservation* and *fertilisation* of the soil should go hand in hand; the one is a necessary adjunct of the other, and every enlightened, educated farmer should know how to render his soil fertile for present use and permanent for the future. The agriculturist should, to do his duty in his honorable, scientific, and useful profession, understand the conditions of fertility, the geological structure, and chemical status of the soil, as well as the elementary components of the crops, and animals produced upon it, the nature of manures, and the true and cheapest mode of maintaining his lands in their original state of fertility, the proper system of labor necessary for restoring to the soil as much of the essential elements as have been taken away by the crops removed from it, and how to renovate lands that have been annually robbed, by a succession of owners, for fifty or a hundred years, of the plant food and top soil so necessary to the production of vegetable life. We will speak on these points more in detail.

Rotation of Crops.—Practical experience has proved that soils will hold their fertility much longer when cultivated upon the plan of "rotation of crops" than if cultivated for many consecutive years in the same cereal or other crop. When the soil is kept too long under cultivation of a single species of plants it becomes *tired*, which is nothing more or less than an exhibition of the exhaustion of one or more of the essential mineral elements needed as food by this plant. A change of

plants allows time for the soil to recuperate this loss from the air, the rains, and the further disintegration of rocks, clays, &c., &c. It was formerly supposed that a judicious system of *rotation of crops* would keep lands always "in heart," and preserve unimpaired their fertility; but scientific research has fully demonstrated the fallacy of this theory, and proven, that while it may keep lands in heart for one generation, the loss of specific materials will eventually show itself, in a gradual falling off in the yield of one or more of the crops, until the lands are entirely exhausted. Deep plowing and thorough cultivation, in connection with rotation in cropping, will do much to keep the lands in a condition to absorb from the atmosphere, rains, heat, and light, the ponderables and imponderables needed, and thereby retain its powers; but even these cannot create elements that are wanting, or change the chemical constituency of plants and seed.

Subsoiling.—In many localities, where the subsoils were formed from the disintegration of rocks rich in plant-food, deep-turning plows will throw to the surface new earth that will become mixed with alluvium, and add much to the fertility of worn lands. But it frequently happens, that too large an amount of this substratum, suddenly exposed on the top of the vegetable mould, will not pulverize sufficiently to absorb the gases from the air, until it has undergone the mellowing influence of winter freezes. In this case it may be better to use the subsoil or bull-tongue plow to follow the turning plow, so as to break up the hard-pan of earth beneath the cultivated mould, which has become impervious to the rootlets of plants, by reason of hard tramping, or the "slicking" or glazing process and pressure of plows, used year after year, at about the same depth, or when the ground was too wet for fallowing. To break through this pan will afford passages to the roots as well as admission for heat, light, rain-water, and frosts, whereby a great improvement in the absorbent capacities of the soil is secured. Where the underlying soil is based upon rocks which easily decompose, as, for instance, the blue limestones of the Silurian or the subcarboniferous limestones, the good effects of subsoiling becomes more apparent, by allowing the roots free access to decomposable rocks filled with organic remains. In such localities the lands thus treated will long resist the wear from cropping, and can for a still greater length of time be kept in heart by the use of such crops as cover, peas, buckwheat, spurry, lucern, &c., &c., whose roots run deep, and convey large amounts of plant food from the atmosphere to the soil. To depend

on the subsoiling process alone would result, like depending on crop rotations along, in an eventual impoverishment of certain essential elements, which must be supplied when removed from the soil by crops through sources outside of the land itself. Rest of land, after rotation and subsoiling, particularly when pasturage of clover or grass is kept upon it, tends greatly to improve it and recuperate its productive qualities. According to the most approved method of subsoiling at present practiced, the subsoil is only loosened, not turned up on the surface; and for this purpose the Mapes or some similar form of subsoil plow is used, since it may be worked in most cases by two horses or one yoke of oxen. It is considered advisable only to disturb a few inches of the subsoil each season, as some subsoils require considerable exposure to the air before their fertilizing effect is developed, and a mixture of too great a quantity of this at a time with this surface soil may sometimes injure the succeeding crops.

Green Crops and Pasturage.—All of our Kentucky farmers are aware that land is improved by turning in green crops, but few understand the principle upon which it depends; and being ignorant of this, they are incapable of judging, unless by long experience, which kinds of green crops are the most applicable. Most green plants, but especially those which present an extensive surface of leaves, are able to appropriate a very large proportion of their weight and bulk out of the elements in the atmosphere; these, being turned under in a green state, enter rapidly into a state of decomposition, and the gases and mineral plant food passing from them enrich the soil in the same manner as well-preserved and well-rotted manure. If the farmer knows what elements of plant food are deficient in his land, he should select those green crops as fertilizers which can supply them when in a state of decomposition. There are a great number of plants suitable for green fertilizers which, in their constituency, exhibit quite different elements from those that are assimilated as food by the useful crop plants of agriculture. There are, also, many of these to be found in every country which possess the power of drawing from the atmosphere, through their leaves, stalks, and roots, many elements which may be lacking in the soil. Clover, field peas, spurry, buckwheat, rye, oats, blackberry bushes, &c., possess this power in a remarkable degree, and are often used by the intelligent farmers solely as fertilizers upon their *tired* or worn lands. The vegetable mould, which makes the rivers and creek bottoms so rich, comes mainly from the rotting of leaves, twigs, and fibres of plants that have been washed from the higher lands. To get the best results from these fer-

tilizers they should, when at the most luxuriant point of growth, and before the seeds are perfectly formed, be turned under the soil by large plows, and there allowed to ferment and rot, so that the soil may absorb all their gases and mineral elements. In light, free, sandy, loamy soils, this system of fertilization is very efficacious; but it answers well upon any land that has not already too great an excess of vegetable mould.

Lime and Gypsum.—The carbonate of lime (common) and the sulphate of lime (gypsum) are most excellent fertilizers, particularly upon lands which are deficient in potash, lime, and sulphur. The black shale lands of the Devonian, and the knobby sandy soils of the Waverly group, are generally “sour,” and sometimes “sobby,” which is rectified by a free use of the carbonate and sulphate of lime, or ashes either of coal or wood. Gypsum is also very advantageous to all tobacco, clover, and wheat lands, on account of its great absorptive powers and affinity for the nitrogen, oxygen, and phosphoric acid of the atmosphere which it gathers for the use of the plants upon which it is placed. Lime also acts, when sown broadcast over the lands, as a dissolver of the *insoluble silicates*, making immediately available for plant food those materials which, in the gradual course of the natural disintegration of the harder particles of the soil, might not be capable of absorption by the root-lets for many years. The calcareous marls, in the same way, act as most powerful fertilizers and stimulants to all kinds of plant life when properly applied.

Other Mineral and Chemical Fertilizers.—The French Government some years ago established at Vincennes, France, an experimental farm, under the superintendence of the eminent chemist and geologist, Prof. George Ville. Every convenience, such as green-houses, hot-beds, field implements, drainage, fertilizers, &c., necessary to carry out his experiments, were furnished him. After several years of close application and practical experimental life, during which time he analyzed all kinds of soils and plants used in France, in a book—“Chemical Manures”—he gave to the world the results of his labors. From this we will make two or three extracts. He says:

“All plants are composed of fourteen invariable elements, four of which are termed organic, and ten mineral, viz:

ORGANIC ELEMENTS.

Carbon,
Hydrogen,
Oxygen,
Nitrogen.

MINERAL ELEMENTS.

Phosphorus,	Sulphur,
Potash,	Chlorine,
Soda,	Silica,
Lime,	Iron,
Magnesia,	Manganese.

"The four organic elements combined are to be found only in living plants and animals. The ten mineral elements belong to the solid earth.

"All vegetable substances are composed of 95 per cent. of the four organic elements, the other 5 per cent. being furnished by the mineral. The organic elements are supplied as follows: carbon, in the form of carbonic acid taken from the air and breathed into the plants through the leaves; hydrogen is supplied by water; oxygen by carbonic acid and water; and nitrogen partly from the air in the form of gas, and partly through the roots from substances in the earth containing nitrogen in the form of ammonia, saltpetre, nitrate of soda, and organic substances in the form of flesh and blood of animals, manure, etc.

"Of the ten mineral elements that compose the other 5 per cent. of plants, six are found in nearly all soils in sufficient quantity for the supply of the plant, viz: magnesia, sulphur, chlorine, silica, iron, and manganese. But deficient in the other four, viz: phosphorus, potash, lime, and soda. These four elements, joined with any substance containing nitrogen or ammonia, are necessary to make a good manure in order to supply the soil with the lacking elements. Therefore, bone-dust, soluble bone, superphosphate, with sulphate of ammonia, nitrate of soda, potash, and sulphate of lime, combined in proper proportions, will make the best manure that can be produced for all lands. Some lands do not require lime, some do not require soda, but nearly all lands will derive great benefit from bone-dust and potash."

What Fertilizers are Needed.—In his "Chemistry of Plants," William Skene, of Louisville, speaks of the experiments of M. Ville as most reliable and instructive: "Professor M. G. Ville, at the experimental farm, Vincennes, France, found that plants were divided into two classes by the manner in which they took up the nitrogen they required. He found that wheat and other grain always take that element from the soil in the form of ammonia or the nitrates; while peas, beans, clover, and all plants having a flower like a pea, take their nitrogen from the atmosphere in the form of gas. This was proved by planting peas and wheat in burnt sand mixed with the ten mineral elements required by all plants to make them healthy, nitrogen being excluded. The peas came up healthy and vigorous, producing good seed; but the wheat showed a want of nitrogen by its yellow, sickly appearance and inferior seed. This proved, therefore, that although peas contain more nitrogen than wheat, they draw their supply from the air, as they flourished well without nitrogen in the soil; and this is the reason why wheat always

succeeds better after clover, the clover (not drawing its nitrogen from the soil, but from the air) when plowed under supplies the soil with a large amount of nitrogen, which is taken up by the wheat through the roots and appropriated to its own use.

"In order to ascertain what kind of fertilizer is most needed on your land, you can analyze it by a simple experiment that will show just what is required.

"Mark off two strips of your field alongside of each other; in the one plant peas, in the other sow wheat. If the wheat fails or gives a small yield, while the peas produce a good crop, that shows that the minerals necessary for the growth of plants are present in the soil, but that it lacks nitrogen; and if the peas as well as the wheat fail, then your land is lacking in the minerals as well as the nitrogen. Or a still better experiment may be tried by dividing a piece of your land into seven strips, sowing each with wheat. In the first strip use no manure; in the second use a mineral manure composed as follows, viz:

Soluble bone phosphate*	2	parts.
Land plaster.	1 3/4	"
Saltpetre	1	"
Sulphate of ammonia.	1 1/4	"

"This composition may be termed a complete fertilizer. In the third strip use the complete fertilizer, leaving out the bone phosphate; on the fourth strip use the complete fertilizer, leaving out the land plaster instead of the bone phosphate; on the fifth strip use the same fertilizer, leaving out the saltpetre instead of the land plaster; on the sixth strip use the same fertilizer, leaving out the sulphate of ammonia instead of the saltpetre; on the seventh strip use the sulphate of ammonia alone. At maturity, if the crop of the seventh strip is equal to the second, ammonia or nitrogen is required, but not the minerals. If the third strip is equal to the second, soluble bone phosphate is not necessary. If the fourth is equal to the second, land plaster (or lime) is not necessary. If the fifth is equal to the second, potash is not necessary. If the sixth is equal to the second, ammonia is not necessary. But if the second strip proves better than all the others, then the complete fertilizer, composed of the ingredients as given in the table, is what your land requires. To give the complete fertilizer a fair trial, about 850 pounds per acre ought to be used.

* Soluble bone phosphate (chemical manures by Ville) is superphosphate of lime or bone-dust dissolved in sulphuric acid.

“Prof. M. George Ville gives the result of three experiments of the above kind. The first made by himself with wheat, at Vincennes, France; the second with beets, by M. Cavelier, at Mesnil, St. Nicaise, Department Somme; the third with sugar-cane, by Mr. Zabrun, of Guadeloupe, West Indies:

FERTILIZERS USED.	Wheat, bush. per acre.	Beets, lbs. per acre.	Sugar-cane, lbs. per acre.
Complete fertilizer	56.44	45.040	50.666
Complete fertilizer without lime	53.33	41.030	44.444
Complete fertilizer without potash	40.44	37.030	32.111
Complete fertilizer without phosphate	34.66	32.080	13.333
Complete fertilizer without nitrogen	18.88	32.000	49.777
Without any fertilizer	15.88	22.020	2.666

“By the above table it will be seen that the soil in which the wheat was sown required nitrogen and phosphate; the beets, nitrogen, phosphate, and potash; the sugar-cane, phosphate and potash. But each piece of land tested required the complete fertilizer to make a good crop.”

The State of Massachusetts has a similar experimental farm under the control of the Agricultural College at Amherst. From experiments made by Prof. Levi Stockbridge, at this institution, we are enabled to give formulas for chemical fertilizers for a number of crops, that have been proven correct in hundreds of trials. In a private letter to the writer, Prof. Stockbridge says: “I am obliged for the interest you take in my experiments and reports, and shall be gratified to hear that the farmers of Kentucky are giving my ideas a practical test. My general idea and practice (in mineral fertilizers) is no longer an experiment in this section, where more than *five thousand acres* of different crops, under all kinds of circumstances, have been grown by the method this year (1876), and with almost unvarying success. My experiments so far appear to establish a series of facts which can be turned to practical account with great profit. But the end is not yet; much in this direction still remains to be proven, and the experiments here will be continued. I may be obliged to continue them several years before I ascertain certain facts I am after, or am able to make a report which will be satisfactory to myself.” In his last report he states how he analyzed all the different crops with great minuteness, and made formulas of plant food in chemical or mineral compounds suited in quantity and constituency to the need of the plants. These he tested upon separate acres of

land, and found that they always produced the expected or desired results, or even more. Here I will insert some of his formulas, and state that the ingredients should be intimately mixed and sown broadcast over the ground, when it is *well prepared* for seeding, and then harrowed or plowed in. *They should never be put in the hill or drill*, as the rootlets of the plants will seek them there, and, if the season is dry, will indolently "burn up," while broadcast sowing mixes them with all the soil, and makes the plants industriously seek the food, and in doing so find moisture at the same time.

Potatoes.

To produce 100 bushels of potatoes per acre and their natural proportion of tops more than the natural product of the land, and for other quantities in like proportion, use—

Nitrogen	21 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 105 lbs.
Potash	34 lbs.		" potash, 35 per cent. dry salt, 225 lbs.
Phosphoricacid . . .	11 lbs.		Superphosphate, 13 per cent. sol. acid, 85 lbs.

Field Beans.

To produce 20 bushels of field beans and their natural proportion of straw, pods, etc., more than the natural product of the land, and for other quantities in like proportion, use—

Nitrogen	53 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 265 lbs.
Potash	33 lbs.		" potash, 35 per cent. dry salt, 198 lbs.
Phosphoricacid . . .	20 lbs.		Superphosphate, 13 per cent. sol. acid, 160 lbs.

Buckwheat.

To produce 25 bushels of buckwheat and its natural proportion of straw per acre more than the natural yield of the land, and for other quantities in like proportion, use—

Nitrogen	37 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 185 lbs.
Potash	50 lbs.		Muriate potash, 80 per cent. dry salt, 100 lbs.
Phosphoricacid . . .	15 lbs.		Superphosphate, 13 per cent. sol. acid, 105 lbs.

Mixed Hay.

To produce one ton of hay more than the natural produce of the land per acre, and in like proportion for other quantities, use—

Nitrogen	36 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 180 lbs.
Potash	31 lbs.		Muriate potash, 80 per cent. dry salt, 70 lbs.
Phosphoricacid . . .	12 lbs.		Superphosphate, 13 per cent. sol. acid, 95 lbs.

Red Clover.

To produce one ton of clover per acre more than the natural yield of the soil, use—

Nitrogen	43 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 215 lbs.
Potash	40 lbs.		Muriate potash, 80 per cent. dry salt, 80 lbs.
Phosphoricacid . . .	11 lbs.		Superphosphate, 13 per cent. sol. acid, 85 lbs.

Timothy Hay.

To produce one ton of timothy hay per acre more than the natural yield of the land, use—

Nitrogen	24 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 120 lbs.
Potash	27 lbs.		Muriate potash, 80 per cent. dry salt, 54 lbs.
Phosphoric acid	10 lbs.		Superphosphate, 13 per cent. sol. acid, 80 lbs.

Fodder Corn.

To produce Indian corn fodder, two tons per acre more than the natural yield of the soil, and in like proportion for other quantities, use—

Nitrogen	20 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 100 lbs.
Potash	66 lbs.		Muriate potash, 80 per cent. dry salt, 132 lbs.
Phosphoric acid	16 lbs.		Superphosphate, 13 per cent. sol. acid, 128 lbs.

Oats.

To produce 25 bushels of oats and the natural proportion of straw per acre more than the natural yield of the land, and in like proportion for other quantities, use—

Nitrogen	23 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 115 lbs.
Potash	20 lbs.		Muriate potash, 80 per cent. dry salt, 40 lbs.
Phosphoric acid	12 lbs.		Superphosphate, 13 per cent. sol. acid, 90 lbs.

Winter Rye.

To produce 20 bushels of winter rye and the natural proportion of straw per acre more than the natural product of the soil, and in like proportion for other quantities, use—

Nitrogen	25 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 125 lbs.
Potash	24 lbs.		Muriate potash, 80 per cent. dry salt, 48 lbs.
Phosphoric acid	16 lbs.		Superphosphate, 13 per cent. sol. acid, 128 lbs.

Rye Straw.

To produce rye straw as a market crop, without the grain, and to obtain two tons per acre more than the natural yield of the land, and in like proportion for other quantities, use—

Nitrogen	10 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 50 lbs.
Potash	31 lbs.		Muriate potash, 80 per cent. dry salt, 62 lbs.
Phosphoric acid	8 lbs.		Superphosphate, 13 per cent. sol. acid, 64 lbs.

Beets.

To produce 100 bushels of beets and their tops on a given area of land more than its natural yield, use—

Nitrogen	11 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 55 lbs.
Potash	25 lbs.		“ potash, 35 per cent. dry salt, 155 lbs.
Phosphoric acid	6 lbs.		Superphosphate, 13 per cent. sol. acid, 50 lbs.

Cabbage.

To produce one ton of green cabbage on a given area of land more than its natural yield, and in like proportion for other quantities, use—

Nitrogen 29 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 55 lbs.
Potash 15 lbs.		“ potash, 35 per cent. dry salt, 90 lbs.
Phosphoric acid . . . 6 lbs.		Superphosphate, 13 per cent. sol. acid, 48 lbs.

The yield of cabbage on well manured land averages not far from 35,000 pounds per acre.

Indian Corn.

To produce 50 bushels of the grain and its natural proportion of stover to the acre more than the natural yield of the soil, and in like proportion for other quantities, use—

Nitrogen 64 lbs.	} in the form of {	Sul. ammonia, 24 per cent. dry salt, 320 lbs.
Potash 77 lbs.		Muriate potash, 80 per cent. dry salt, 154 lbs.
Phosphoric acid . . . 31 lbs.		Superphosphate, 13 per cent. sol. acid, 248 lbs.

Wheat.

To produce 25 bushels of wheat and the natural proportion of straw per acre more than the natural yield of the land, and in like proportion for other quantities, use—

Nitrogen 41 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 205 lbs.
Potash 24 lbs.		Muriate potash, 80 per cent. dry salt, 48 lbs.
Phosphoric acid . . . 20 lbs.		Superphosphate, 13 per cent. sol. acid, 160 lbs.

Swede Turnips, or Ruta-bagas.

To produce 100 bushels of turnips and their tops more than the natural yield of a given area of land, and in like proportion for other quantities, use—

Nitrogen 11 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 55 lbs.
Potash 18 lbs.		“ potash, 35 per cent. dry salt, 118 lbs.
Phosphoric acid . . . 8 lbs.		Superphosphate, 13 per cent. sol. acid, 63 lbs.

Onions.

To produce 100 bushels of onions and their natural proportion of tops on a given area of land more than its natural yield, and in like proportion for other quantities, use—

Nitrogen 11 lbs.	} in the form of {	Sulph. ammonia, 24 per cent. dry salt, 55 lbs.
Potash 9 lbs.		“ potash, 35 per cent. dry salt, 54 lbs.
Phosphoric acid . . . 4 lbs.		Superphosphate, 13 per cent. sol. acid, 32 lbs.

Tobacco.

To produce 1,500 pounds of the dried leaf of Connecticut seed-leaf tobacco, with its natural proportion of stalks, more than the natural yield of the land, use—

Nitrogen 119 lbs.	} in the form of {	Sulph. ammonia, 24 per. cent. dry salt, 595 lbs.
Potash 172 lbs.		“ potash, 35 per cent. dry salt, 1,075 lbs.
Phosphoric acid . . . 16 lbs.		Superphosphate, 13 per cent. sol. acid, 125 lbs.
Lime 160 lbs.		Sulphate lime, 79 per cent. dry salt, 500 lbs.
Magnesia 38 lbs.		“ magnesia, 16 per cent. dry salt, 475 lbs.

The above formulas differ slightly from the one adapted to the tobacco of the South.

These *formulas* are valuable, inasmuch as they show the relative amounts of nitrogen, potash, and phosphoric acid contained in each of these staple crops.

Other formulas, nearly as good as these and much cheaper (probably at half the cost), can be supplied from Louisville or Cincinnati to the farmers of Kentucky. The German Kainet has been coming freely into New York at a cheap rate, and can be had in nearly all the Western cities; it is composed of most of the mineral salts that are needed for plant food, and by the addition of bone-dust and gypsum will do well on nearly all our staple crops. The same may be said of the "nodules" and marls of Charleston, South Carolina, which are exceedingly rich in phosphoric acid, potash, and nitrogen.

Ashes and Leaves.—Every farmer knows how crops of every kind grow when manured with ashes or the leaves of trees. This is because these contain in large quantities potash, ammonia, sulphur, lime, gypsum, soda, chlorine, magnesia, phosphorus, and manganese. Leaching deprives them of nitrogen, which, however, is easily restored by the addition of ammonia.

Barn yard Manures.—These are good, and should always be used, but they are not nearly so effective or cheap in application as chemical fertilizers, owing to their bulkiness and half-rotted condition. If the farmer will pile his barn-yard manures under shelter during the fall and winter, and mix with them in layers thin stratas of gypsum, salt, and ashes, he will save three fourths of the essential gases that now escape and pass into the atmosphere, and make his compost four times more valuable as plant food. Peter Henderson, the great New York gardener, who has been the most successful producer of vegetables in America, says: "I have had as good results from *one ton of bone-dust as from seventy-five tons of stable manure*, and I have also found that bone-dust will keep off striped bugs from cucumbers, &c., and prevent club root in cabbages." The manures from hen-houses, and the dirt from the floor of smoke-houses, are excellent fertilizers.

Fertilizers for Seed.—It often happens that a farmer gets a fine crop of stalks and blades, but little seed. This is caused by a lack of phosphoric acid and potash in the soil, which may be supplied through sulphate of ammonia, saltpetre, salt, guano, stable manure, cotton seed, &c. A good formula also is a compost of bone-dust, saltpetre, and ashes.

The following table shows the principal minerals contained in the roots, stems, and seeds of all plants as found by analysis of their ashes after being burned:

MINERALS FOUND.	Percentage in roots.	Percentage in stems.	Percentage. in seeds.
Phosphoric acid	1.70	2.20	46.00
Magnesia	1.97	3.92	13.77
Potash.	2.87	15.18	32.59
Lime	.88	3.00	1.19

Observe the large amount of the first three elements required to produce good seed.

Lasting Manures.—A very prevalent idea among farmers is, that what they call a lasting manure is cheapest and best. There never was a greater fallacy. We are now treating of the nutrition of plants, and not of the formation of soils to act mechanically on the plants. Why does the farmer want lasting manures? Is it for his interest to use such? Plant food, whether in the shape of barn-yard manures or chemical fertilizers, is a costly material. The labor and time in hauling barn-yard manures has to be paid for in cash. Is it policy to have more of it put on than what is needed for the present crop, to be exhaled and lost in the atmosphere? Mineral or chemical fertilizers cost cash. Is it wise to place on land *cash*, and lose the compound interest for several years, in order to have more on the ground than one crop can assimilate as food? All fertilizers lose more or less by evaporation—more than the compound interest on the money cost. Is it wisdom to lose all this in order to have “lasting manures?” Certainly not. The true plan is to find out, by scientific investigation, just how much and what kinds of fertilizers are needed to produce a given crop, and proceed to manure and cultivate accordingly, and to let every year provide for itself, so as to lose no compound interest. There will naturally more or less be retained in the soil of each fertilizer used every year, which will always keep the land in heart for the grass and clover rotating crops. This is the way agriculture has been carried on for centuries in Japan and China, where the lands now produce larger crops than they did a thousand years ago; but the greatest care is there taken to see that *every year* plant food is returned to the soil equal to that taken off and used or sold. In this these people are far ahead of any nation, either in Europe or America.

Tile-drainage.—For the preservation of the soil, nothing equals tile-drainage, whether in a flat, level country or in rolling lands. It is also,

like deep ploughing, a great renovator of worn or washed lands. The most extensive experiments in tile-drainage in the United States are probably in Preble county, Ohio, and in parts of Massachusetts, where the lands are increased in value three fold by tile-drainage. Lands thus under-drained produce much larger crops of all kinds, and do not wash by even the hardest rains, owing to the porosity of the soil and its increased power of absorption.

Dr. David Dale Owen, in his admirable Geological Report of Kentucky, says: "It is very essential that a soil be made porous by tillage, since all the rain that runs off, without soaking into it, carries away with it ammonia, nitrates, and other fertilizers, which would otherwise be absorbed and appropriated. There is another great advantage in rendering the soil porous: free access of air is admitted, and more carbonic acid admitted with the water, so that, independent of the service rendered by carbonic acid, as a source of carbon, it exerts a great solvent power over the mineral constituents of the soil, and thus renders a larger supply available. In thickly settled countries, where farming produce is high and labor cheap, great advantage has been obtained by under-drainage. In the western country, what little drainage has been done, for the most part has been effected by open ditches.

"Under-drainage has many advantages over open ditches. It does not cut up the ground nor foster weeds. All the water, in passing through the soil, gives up its condensed fertilizers, which are, in a great measure, lost in the flow of surface water. In its passage downwards it removes or changes effete matters, secreted from the roots of plants, which are deleterious to vegetation. Under-draining also warms the surface soil, and the cooler substratum condenses the moisture out of the atmosphere, which has free access to it; this, in a great measure, counteracts droughts, besides effecting all the good already indicated, as obtained by the free access of the air to the soil. Under-draining is said, also, to prevent the dying out of grasses, by keeping their roots free from injurious influences, to distribute nutriment more effectually, besides removing excess of water, and thus deepening the surface soil. It renders vegetation earlier in the spring, and prevents the freezing out of grain in the winter, also the too rapid evaporation of the water, and the formation of hard crust on the surface.

"We are apt to regard draining as requisite only for wet and low swampy ground; but experience seems to prove that it is nearly equally beneficial in counteracting too great dryness. It is estimated by

farmers, in districts where it has now become an almost universal practice, that it increases the profit on the land ten to twelve per cent.; and pays for expenses of under-draining in three years. It is said, also, and I have little doubt of the fact, that it removes the malaria or whatever other cause produces intermittent fevers; so that these diseases have almost disappeared from districts affected with such disorders previous to its introduction. In addition, investments made in under-draining farms have proved to be amongst the safest now made in the farming districts of England, and the Government of Great Britain encourages it by loaning money at five per cent. to aid in extending this system; and money can be obtained on easy terms from other sources for the same purpose; all of which is sufficient proof of its success in a pecuniary point of view in that country."

It is estimated that under-drainage increases the profit on almost any land from ten to twenty per cent., and that it is beneficial not only to low and swampy soils, but almost as much so for hill lands, or those of a rolling surface, by counteracting dryness, and preventing too great a tendency to wash into gullies. It, above all other plans ever tried, tends to keep the surface soil from washing off into ravines and creeks, by increasing the capacity of the soil to hold the rain-water, through absorption, at fast as it falls, even during the heaviest storm.

The stiff clay lands in the vicinity of the black shale, in Kentucky, and also the deep red and yellow clays of the "barrens," can hardly be brought into the highest state of successful cultivation without under-drainage. The porous tiles, made of burnt clay, form the best material for under-drainage. The pipes should be from two inches to six inches diameter, according to the location of the ground and other circumstances. These pipes should be laid not less than two feet (but four or five is better) under the ground, so as to be clear of all winter freezes, deep plowing, or other obstructions; and great care should be taken that the fall in the drainage of the pipes, which need not be more than three inches to the 100 feet, is uniform, and not so imperfect as to fill up with mud or settlings. Skillfully laid under-drain tile pipes will last for one hundred years, without need of repairs, as has been evidenced in England and France. Any unglazed burnt clay tiles will be sufficiently porous to allow water to soak through them from the top and run off, no matter how compact a clay may surround it. Judge Abner Haynes, of Preble county, Ohio, says: "I have constructed as fine ditching (tiles) as any man in our county; I have 1,200 rods on 205

acres. The first thing in tile-drainage is good fall, and that fall kept open, draining it into some natural cut or branch. The next thing is good engineering, so that some parts of the ditch is not higher than others, in which event sediments will stop up the tiles, but let the fall be uniform, so that the stream of water will flow out with ease and rapidity. You can construct ditches much better in wet seasons of the year than in dry; the ground digs easier, and the water, if it rises in the ditch, will do for a guide for laying the tiles. Two crops will pay for any tile-drainage well constructed, I don't care if it costs a dollar and a half a rod; and then, when these drains are thus well constructed, they add ten dollars per acre to the land, and are a permanent value to the freehold. I don't care if the ditch is seven feet deep, it is better than four feet, and four feet is better than three." Drains (tiles) should be constructed so as to have main leads and lateral branches. A main lead of 200 yards length ought to be not less than four inches diameter, and of four or five hundred yards six inches. A two-inch drain will carry off water for a distance of twenty yards on each side of the drain. That is, such tiles should be not less than six to eight rods apart; but, as a general rule, the deeper the drain the farther apart can be their lines. Half a mile tile-drain of six inches, with lateral branches, well laid, will usually run a stream like a spring from eight to ten months in the year. It costs from fifty cents to one dollar per rod to put down tile-drainage. There are spades made on purpose for tile-draining.

For Orchards and Vineyards.—Peach trees require such elements as are found in wood ashes, and some iron and sodium; therefore it will greatly improve these by placing around their roots, for several feet from the trees, salt, ashes, and iron cinders. Pears want iron and ashes, and iron cinders will benefit them, and often make barren trees become good producers. Similar fertilizers, with tobacco stalks, are good to place in orchards of apples, cherries, and plums. Grapes want a well-drained calcareous rich soil, that is, rich in the elements that go to make the vine and fruit. Superphosphates, gypsum, and good vegetable mould are what is needed for vineyards. Garden vegetables require fertilizers like other farm crops.

ENTOMOLOGY.

Insects, bugs, beetles, and worms are the plagues of a farmer's life; but, fortunately, Kentucky is as free from these pests as any other portion of the United States. The numerous kinds of worms, insects, and grasshoppers, which so seriously infest the far West, are mostly unknown in this State, as are also those that commit such ravages upon the crops of the Cotton States. But still we have enough to cause a great deal of trouble to our farmers, and some years to seriously injure their crops. There are about 30,000 kinds of these pests known to exist in North America.

Nature seems to have provided parasites to feed upon every class of vegetation grown upon the surface of the earth, and these occasionally come in such numbers as to destroy certain crops in spite of the best and most laborious plans of the soil cultivators. The midge, Hessian fly, weevil, and chintz bug on wheat; the cut-worm, bud-worm, horn-worm, and green grasshopper on tobacco; the different kinds of borers, curculios, bugs, caterpillars, beetles, grubs, &c., &c., on fruit trees and garden products, are all dreaded more or less at certain seasons of the year, and a great portion of farm labor is expended in protecting crops from their ravages.

Unfortunately the science of man has, up to this date in the world's history, been wholly powerless to protect vegetation from these parasites, except by the slow process of catching and killing the intruders. The remedies prescribed as preventives do not always answer well the object intended, and the poisoning process, though sometimes resorted to, is always liable to many objections. The governments of many European and American countries have Commissioners of Entomology, whose duty it is to find out the nature, habits, food, and peculiarities of all kinds of parasites, with a view to their extermination; and they are making close and skillful research into everything that will give information and throw light upon the subject; but as yet their labor has been in vain in the discovery of any practical method for the riddance of the evil.

The Department of Agriculture at Washington, and the Bureaux of Agriculture in several of the States, employ practical men in the most

earnest endeavor to protect the crops of the country, and we can but hope that ere many years more pass they will succeed in their objects.

We will not attempt here to give formulas of preparations and quack nostrums which are advertised for the destruction or prevention of insects, and which are as numerous almost as are the species of the pests themselves, but will wisely withdraw for the present from the contest between the farmers and the parasites, and let them fight it out on the old line.

We will state, however, that the universal experience of farmers is, that crops grown on well cultivated and well fertilized lands are always the least damaged by insects.

CROPS AND CROP SYSTEMS.

The great variety of soils, formed by the disintegration of the numerous strata of rocks, to be found between the Mississippi river on the west and the Virginia State line on the east, and the differences of elevation, give Kentucky a very wide range in its agricultural products. About three hundred and thirty-three feet of altitude is considered equivalent to one degree of latitude. Upon this data, we find that from the highest points of the mountain counties to the lowlands of the Mississippi river bottoms, we have in the State the equivalent of not less than ten degrees of latitude, which give us a climate varying from nearly semi-tropical in the bottoms to that of Canada on the mountains. A peculiarity of the soil and climate is the adaptability of each to the growth of all the cereals, fruits, and vegetables of the warmer and colder regions of the north temperate zone. The cranberries, apples, pears, cherries, and Irish potatoes of the northern, and the sweet potatoes, peaches, nectarines, plums, and sorghum of the Southern States, grow equally as well as they do in either section, while maize, wheat, barley, rye, oats, clover, grasses, hemp, flax, and tobacco here find both soils and climate the most congenial to their perfect development.

Maize or Indian Corn.—This cereal, which is more extensively used by the average Kentuckian than any other, and is the source of both

bread and drink, is a native of the American continent, and was found among the aborigines when the first white men landed upon their territory. It yields more largely than any other grain, an average crop being about thirty bushels, while the best land grow from forty to sixty bushels, and, with extra cultivation and manures, have been known to yield from one hundred and twenty to one hundred and thirty bushels per acre. The varieties of corn grown in the State are almost innumerable. The large red-cob variety, known as "gourd seed," has been a great favorite upon the rich bottoms and prairie or "barren" lands; the yellow upon thin, rolling uplands. The Commins, Willis, and Baden corn, each a hard, white, flinty variety, are extensively planted on the medium soils, and are valued highly on account of their freedom from rotting, and their early maturity. The grains of these latter, however, are not so deep nor the ears so large as the "old gourd seed." A cross between the gourd-seed and either of the others partakes of the excellencies of each variety—the flintiness and freedom from rot of the one, and the large size of the other. The Department of Agriculture at Washington has procured many other varieties and sent them through the country on trial; but very few of them ever held their position against the above-named varieties, in the general estimation of the public. The annual average production in the State of this great staple is about 65,000,000 bushels.

Wheat.—Next to corn, wheat is the most important cereal. This crop varies in the State from 7,000,000 to 12,000,000 bushels per annum, and the average yield varies from 12 to 16 bushels per acre. The Broughton, the Tappahannock, the Fultz, the Lammas, the Mediterranean, and the Red May, are the principal varieties sown in the State. There are also a large number of sub varieties with local names. The Blue Stem was once a great favorite, but owing to its frequent failure in making a good yield, it has fallen into disuse. The varieties of amber wheats are said to be less liable to smut and rust than the white kinds, but not so prolific. The bearded varieties are less grown than formerly. The wheat produced in Kentucky is remarkable for the plumpness of the berry, and its excellent flouring qualities. This flour commands in every market where sold a higher price than the general average of most of the States. The West Indies and Brazil markets give preference to Kentucky and Tennessee flour over all others produced in the Mississippi valley, because the nutritive elements in our flour are so rich that the climate affects it less than any other. The bakers will pay more,

because it absorbs about sixteen pounds more water to the barrel in baking, and keeps sweet for a longer period of time. The crop matures nearly a month earlier than in New York or Pennsylvania, and consequently commands, at the first of the season, a ready market, at good prices.

Rye.—This crop is not so extensively grown as in former years. It is admirably adapted for fall and winter grazing, and for a green fertilizing crop. It grows well even on thin, worn lands, where red clover cannot be made to "catch." If rye is sown on thin lands, and not grazed too heavily, and turned under in a green state, it becomes an excellent forerunner of clover, spurry, or buckwheat, and will greatly aid either of these in renewing and refructifying the soil. The common and the "White Canada" are the varieties mostly used. The distilleries use this cereal, in preference to either wheat or corn, in making certain kinds of whisky. Every county in the State seems well adapted to its growth, and more or less is produced in every neighborhood. Used for cut feed, like oats, it answers a fine purpose; and if allowed to mature, and then fed in this way, is considered by many farmers equal to the best hay. Usually the price is about the same as wheat, although it is much more easily raised, and by far less subject to disasters than the latter crop. Fed in the field to hogs when ripe, rye seems to act remarkably on the animal economy, and while it gives a thrifty growth to the animals, appears also to cure them of all kinds of diseases. Sheep, cattle, and horses derive great benefit from rye pasturage, when the grain is ripe, becoming smooth, active, and healthy upon its use. Doubtless the trouble of keeping it from mixing in the fields with wheat is the main cause why it is not more extensively sown.

Oats.—Previous to 1856 this was one of the most certain crops grown in the West; but in that year, contrary to the experience of the oldest farmers, "the rust" invaded the entire oat crop of the State, and from that time until the present, this disease has rendered oat tillage very precarious. No one has ever satisfactorily accounted for this sudden change of the habits of rust, which, in previous years, was only dreaded on account of its ravages on wheat. The black oats, the "ruffled," the white, Scotch, Irish, and Canada oats, are all sown. Latterly good varieties have been introduced from California, and even Australia, and also the Red Southern oats, which are said to be less subject to the rust than the old native kinds. The yield formerly was fully 25 to 40 bushels to the acre; but of late years it frequently is less than two thirds of this amount. Fifty, sixty, and even eighty bushels have frequently been

produced on the acre, when the lands were new and everything favorable. In cut feed no provender is superior to this cereal for horses, mules, and cattle, the straw answering well all the purposes of hay, while the grain builds up the toughest muscle and bone. As a green crop, to be plowed under for fertilizing purposes, oats do admirably, and seem to add to the soil a large amount of nitrogenous plant food, which is taken by the plant from the atmosphere. Grazed and fed on the soil, it is an excellent fertilizer, and it is a good crop to be sown in connection with either white or red clover.

Barley.—The number of acres devoted to barley in the State has greatly increased within the last few years, owing to the rapidly growing demand from the breweries in all the large towns of this and the adjoining States. Beer-drinking has become fashionable, and barley every year becomes a crop of more and more importance. It flourishes well in every section of the country, and will average over 25 bushels to the acre in almost any county where it is carefully cultivated and well harvested. Good lands frequently produce from forty to sixty bushels, and many farmers think it far more profitable than wheat, as it costs about one third less in raising. For grazing purposes, barley is preferred to any other grain for colts and calves, which seem to fatten on it rapidly. In price, by the pound, it is generally about the same as wheat, but by the bushel is not so high, unless of a fine bright color. Doubtless it is destined to become here, as it is in Europe, a leading staple; and, as the foreign beer-drinking element of our population increases, the barley crop will keep pace, or even go beyond, until it comes into general use as provender for all kinds of stock, as it is now used in all the older countries of the world. The largest portion of the crop is now sown in the counties adjacent to Louisville and Covington, and in what is known as the "Blue Grass Region," where it flourishes most luxuriantly.

Buckwheat.—This crop grows well in Kentucky, yet it is but little cultivated, owing to the fact that there have never been mills adapted to grinding it into flour. Our people do not use "buckwheat cakes and molasses" very extensively, except in the cities, where the supplies of flour are brought from Pennsylvania and Ohio. The old Virginia plan of using "shorts for pancakes" at an early date took strong hold upon our citizens, and they have never outgrown the habit. But we see innovations are being made, and occasionally fields of buckwheat can be seen dotting the country, either for the use of man or bees. For fertilizing purposes, this is one of the best plants known, as it draws largely

from the atmosphere; and, when plowed under in the green state, carries to the soil a large amount of nitrogeous plant food. For bees, it has no equal except white clover, and even that is not considered its equal by many bee fanciers. If sown early for fertilizing purposes, two crops can be turned under in one season with surprising results. For healthy food and bread that will give good muscle and brain power, probably buckwheat should head the list of all cereals, while on medium soil no crop can be raised at a greater profit.

Sorghum.—The Chinese sugar-cane was introduced into this country a short while before the civil war, and for a time seemed to fill a vacuum in farm crops that was greatly needed; but the great injury done land by the rapid growth of the cane, and its exhaustive nature, was not compensated by the value of its products, and, therefore, it has fallen into disuse, except as a "patch crop," from which small quantities of molasses can be made. No doubt, upon very strong alluvial bottoms, it may be made a valuable staple, but it does not pay well on uplands.

Broom-corn.—Like sorghum, broom-corn is a great soil-exhauster upon upland soils, and is not a favorite crop with farmers, except just enough for family use. Some years the high price at which its products sell makes it a very desirable staple, notwithstanding its exhaustive qualities. On bottom lands it will do less injury, and can be cultivated with profit. The increase in our city population has caused a much larger demand for broom-corn than formerly, and the probabilities are, that this demand will increase from year to year. The cultivation of this crop is very simple, and requires no greater attention than that of maize or Indian corn, while the profits accruing are generally much larger.

Irish Potatoes.—This is probably the most profitable vegetable crop grown in the State. Every division of our territory seems well adapted to its cultivation, while a yield varying from 75 to 400 bushels per acre shows its prolific quality in our soil. Around Louisville, Covington, Paducah, Lexington, and other cities, it becomes a leading staple, and is extensively raised by the garden farmers. When planted in February and March it seldom fails of a large crop, where the lands are properly prepared and manured. No plant repays better for the use of fertilizers, and the tubers improve in quality in proportion to the perfect adaptability of the soil, caused by the addition of the needful plant food to the dirt. Some seasons the striped potato bug do much damage, and of late years the regular Colorado potato beetles have been committing ravages on the crops; but they very seldom do much injury to the early

planting. The varieties planted are numerous, and each kind has its friends. The neshanocks, the pinkeyes, the russets, the peerless, the early rose, and peachblows are the chief varieties used in the State. Early in the season large quantities of this tuber are shipped from Kentucky to the Northern markets, and a still greater amount is imported each winter to fill the vacuum. The size of the crop might be indefinitely increased, if our farmers could be made to forget the old idea that a "potato patch" belonged to one corner of the garden, which was approachable only by the cook when she was preparing dinner for the family. Like many others of our most useful plants, the potato is a native of the American continent, and was found in use among some of the more advanced Indian tribes when the country was discovered. It grows wild in Mexico, and generally along the base of the Cordilleras and Rocky Mountain chain, as far north as the forty-second degree of latitude. It is probably more used both in Europe and America than any other vegetable known to man.

Sweet Potatoes.—This is a native of the tropics, and by degrees has been made to accommodate itself to every latitude as far north as the great lakes. It flourished well in Kentucky, particularly on the lowlands or sandy soils. It is a great favorite with the farmers, and almost every homestead can boast of a "sweet potato patch." It is not equal to the Irish potato as a crop for profit, nor is it so certain in its yield; still, with proper care, there is seldom a season when there is even a partial failure. In this climate care must be taken to preserve the tubers during the winter from the cold, otherwise they are quite prone to rot. The plants require to be forced in a hot-bed in the spring in order to insure an early stand, but many plant in the hill without any beds, just as they do the Irish potato. There is no special care needed in the cultivation, except to keep the ground mellow and clean of grass. The crop of the State is not large enough for home consumption, consequently thousands of bushels are imported every year from the more Southern States. A greater subdivision of farm crops would bring this plant into much more profitable use, and, as its cultivation rather improves than injures land, the smaller farms might increase the yield at fine profit. It has a sufficiency of saccharine matter to make it the equal of beets in producing sugar.

Artichokes.—This crop is very serviceable for hogs, and in some sections has been planted to a considerable extent. A field when once

well set will retain seed for many years, and give employment to hogs in search of the bulbs. Those farmers who have tried the crop say that it improves land, and is on some soils more profitable than corn. The cultivation is very simple, and the yield large. It is not so good for hogs as chufas, which are but little raised in Kentucky.

Pea-nuts.—The “goober peas” or pea nuts are a native of Africa, but are well adapted to the light, thinner class of soils of our State. North Carolina, Georgia, and Tennessee have for fifty years nearly monopolized this crop, and only since the war have emigrants from these States introduced this ground nut into Kentucky as a regular crop. Its cultivation is very simple, whether planted in hills or ridges. The lands, after being well and deeply broken, are then planted and cultivated as potato land, the hoe being the principal implement employed. The best soils for pea-nuts are those which are well drained, and have a large quantity of intermingling gravel or sand. The bottoms lying between flinty ridges are favorite spots, though the pea-nut grows well wherever sweet potatoes flourish.

Hemp.—This is a leading staple in the “Blue Grass Region” of Kentucky, and one which grows here in greater perfection than in any other section of the United States. From the earliest settlement of the State up to the present time, Kentucky has taken the lead in the production of hemp, and will probably retain it for a long time to come. The quality of the fibre has been greatly improved by the introduction, a few years since, of the Chinese variety, which has now become generally sown throughout the hemp-growing belt. A further distribution of fresh seed, obtained from the Chinese and Japanese embassies at the Centennial Exposition at Philadelphia last year, by the Geological Commission of the State, will no doubt cause a further improvement in this valuable crop. A recent article upon the culture and management of hemp and hemp land, by the eminent chemist, Dr. Robert Peter, of the Geological Survey, after giving a table of the proportions of mineral ingredients removed from the soil in certain average crops, says:

“We see that while an average crop of hemp takes only an amount of potash from the acre varying from less than one pound to less than one third of a pound, the wheat crop takes nearly five and a half pounds, the corn crop more than eight, in the grain alone, and the tobacco crop nearly seventy pounds; and while the hemp crop carries off only from one and a quarter to two pounds of phosphoric acid, the wheat will take more than nine, the corn more than eleven, in the grain

alone, and the tobacco more than eight pounds. We notice, also, that the removal of the hemp-herds (which are believed by some of our practical farmers to bear a proportion in weight to the hemp fibre of three to one) will take from the land greatly more of its essential ingredients than the hemp fibre itself; for while the merchantable hemp holds less than a pound of potash and two pounds of phosphoric acid in its composition, the equivalent quantity of hemp-herds holds more than four pounds of potash and nearly three pounds of phosphoric acid.

“As we have stated, it is the common practice of our farmers to permit the hemp-herds to be burned up in the heaps where they fall near the hemp-brakes. Some erroneously believe, indeed, that they would exert an injurious or poisonous influence on the land if spread over it; but it is evident that this practice tends more rapidly to reduce the fertility of the hemp field than the sale of the hemp fibre; and that it would be beneficial to adopt some plan of reducing the hemp-herds to the condition of vegetable mould, and to spread it over the surface, where it would not only tend to keep up the proportion of humus, but would re-supply much of the essential mineral elements in a soluble or available form. If it is found that the recently scattered hemp herds seriously interfere with the cultivation or growth of the next succeeding hemp crop, it would doubtless pay to haul them into heaps to rot, or to spread them over some other field, which might be in preparation for hemp in a system of rotation adapted to this culture.”

Prof. Peter then proceeds to say that hemp lands can be made to retain their productive capacity by rotting the hemp upon the lands where grown, so as to let all the glutinous substances washed out of the stalks by the rains be re-absorbed by the soil. He also highly recommends the plowing under on hemp lands of green crops of rye, buckwheat, clover, &c., &c., which process of fertilization is one of the cheapest and best for all limestone lands.

Flax.—The cultivation of flax has never attained that importance in the United States that it has in different countries in Europe, from the very obvious reason that the cotton-producing capacity of the country is so great that it fills a great portion of the necessary wants which are supplied by the flax industry in those countries; and so long as cotton is the great leading Southern staple, it is not likely that any contingency will arise that will stimulate flax industry greatly above its present status.

In the early settlement of Kentucky nearly every family had a “flax patch,” and every member of the family was clothed with the products

of the flax-wheel and hand-loom. But now the cotton fibre has completely supplanted the place once occupied by flax for clothing and other purposes, and even the cotton seed oil and petroleum have partially taken the place of the linseed oils of olden times.

The subdivisions of agricultural pursuits will, however, at no great distance in the future, reinstate this crop upon a more stable foundation than it ever held before. If the cultivation of flax is so remunerative to the Irish farmer, who pays from \$10 to \$25 per acre for the rent or use of land, a person would naturally conclude that it certainly would pay to raise flax on the cheap, rich lands of Kentucky. Statistics of this crop in Ohio and other Western States show that it pays better per acre, when properly cared for, than either corn or wheat. The millions of dollars which the people of the United States now send abroad each year for linen goods, could be kept at home if the flax plant received the attention due to it. A new "flax-brake" has recently been patented, which can easily break and clean several hundred pounds per day, at a very small cost, which will no doubt come in general use, when we shall expect to see a very large increase of this crop in all the mountain counties of this State, as well as in other sections adapted to its cultivation.

Cotton.—This staple grows well in some of the southern and southwestern counties of the State, and "patches" for home use are cultivated in almost every county. The counties west of Tennessee river cultivated extensive fields of this staple, for foreign shipment, until within a few years back, when the high price of labor and the low price of the staple caused it to be less valuable than other crops, such as corn, wheat, hay, tobacco, and stock. Whenever "cotton is high" these farmers at once begin to plant, but when low, they fall back to other more lucrative productions. The amount raised by the "Border States" have but little influence upon the general estimates of values in ordinary times; but when prices advance materially, Kentucky, North Carolina, Virginia, and Missouri become integral parts of the cotton belt.

Tobacco.—In this important staple Kentucky leads the other States of the Union. Over 150,000,000 pounds is no unusual crop, when the year is propitious. The yield per acre averages about 700 to 800 pounds, although 1,200 to 1,600 pounds are frequently grown on the richest lands. This weed is of American origin, and was found in use among the aborigines when Columbus discovered the continent. It grows in every climate from the torrid zone to the arctic circle, varying according to the soil, latitude, and topographical peculiarities. In Kentucky the varieties grown are the heavy, rich, tough, gummy, and

leathery "Clarksville or Hopkinsville Shippers," the "Owensboro and Henderson Stemmers," the bright Paducah manufacturing tobacco, the Mason county leaf, and the cutting leaf of Owen and other counties. The local names are given because the soils in the counties neighboring to these markets produce principally those specific varieties. At the Louisville market, which is the largest in the United States, all these and many other sub-varieties concentrate, neatly packed in hogsheads, and are sold at auction on "the breaks." The "Bacon Creek or Hart County Leaf" is a most beautiful wrapping-leaf article, much sought after by the manufacturers of fine chewing tobaccos. The heavy "Hopkinsville Shippers" are mostly exported to the English, French, German, and Mexican markets, and there prepared for use. This quality of tobacco is very rich in nicotine and potash, and will absorb a large amount of water in its manufacture; consequently, in States where the governments demand a high import duty, it becomes an object to manufacturers to have tobaccos of the greatest strength, that will absorb the largest amount of water, and bear the greatest mixture with substitutes or inferior grades of home-grown tobacco.

England charges an import duty on leaf tobacco of about	72	cents per pound.
Germany charges an import duty on leaf tobacco of about. . . .	2 $\frac{3}{4}$	cents per pound.
Belgium charges an import duty on leaf tobacco of about. . . .	3	cents per pound.
Holland charges an import duty on leaf tobacco of about		nominal.
Russia charges an import duty on leaf tobacco of about. . . .	12	cents per pound.
Turkey charges an import duty on leaf tobacco of about	70	cents per pound.

In Austria, France, Italy, and Spain the governments monopolize the entire commerce in tobacco under the direction of "Regie Commissions." The United States taxes the manufactured tobacco about 20 cents per pound, or fully *two and a half times* the price received by the producer.

The "Western District" of Kentucky produces much fine shipping leaf, and also an excellent article for "chewing-plug" and choice bright wrappers. For manufacturing purposes this cannot be excelled. The "Yellow Banks" and "Red Banks" tobaccos (of the Henderson and Owensboro districts) are particularly adapted for "strips," suitable to the English markets. The best cutting leaf in the United States grows in the counties above Louisville, bordering on the Ohio and Kentucky rivers. The number of factories in Louisville and other cities of the State, where the staple concentrates on sale, are very numerous, and gives employment to several thousand operatives. The mountain counties do not grow tobacco so extensively as the level sections of the

State, not that the soil is unsuited for this purpose, but mainly from the fact that the facilities for getting it to market are too limited to induce the people to begin its cultivation. By a long-continued series of selections and adaptations, the farmers have so changed the varieties of tobacco, that now every section of country has the very kinds most prized, and which are produced with most profit on that particular soil.

It seems strange that the people who so universally use this weed as a luxury in smoking, chewing, and snuffing, do allow monarchical and despotic governmental law-makers to tax them so grievously, wantonly, and unjustly upon this specific article, and particularly is it strange that the farmers of the United States should suffer a government, which they in part control, to so despotically tax them and their labor, in order to raise millions of dollars every year from their hard-earned labor, to be bestowed upon high-salaried officers, standing armies, useless navies, hundreds of thousands of pensioners, and pet National Banks, and bond-holders. This heavy, burdensome tax on the productive energy of the planter ought to be at once removed, as should all protective tariffs and specific taxes, which now bear down to the earth the laboring classes of every industry, for the benefit of all kind of government pensioners and the moneyed cliques of the commercial centres. I would like to dwell on this subject of tobacco taxation had I space, that our people might see some of the reasons why *hard times* are always bearing on the laboring men of the country, whom the "professional politicians" vauntingly and sarcastico-demagogically call the bone and sinew of the government, when these same laboring classes are placed by our legislators, in fact, in the same relation to the government that the dray-horse is to the dray, namely, where they can do all the work and bear all the burdens.

Other Crops.—There are many other crops grown in particular localities, or in moderate quantities for home use, such as peas, beans, turnips, mangoles, hops, palma christi, melons, &c., &c., for all of which the climate and soil are so well adapted that they need have no particular system of cultivation or history given of them.

DAIRYING.

Dairying is of very ancient origin. The manufacture of cheese and butter was known and practiced before history was written. In the Bible we read where Job says: "Hast Thou not poured me out as milk, and curdled me as cheese?" And in Genesis, in Abraham's time, when he had washed the feet of the angel visitors, and given them cold water, it is written: "He took butter and milk, and the calf which he had dressed, and set before them, and he stood by them under the tree, and they did eat." Homer speaks of "loaves of cheese and unctuous butter" being used by both Greeks and Trojans, before the days of Menelaus. From these early days till the present milk, cheese, and butter have been among the chief articles of man's food.

The great co-operative dairy systems, however, now so advantageously and profitably used in this country and Europe, are of recent origin. Mr. X. A. Willard, President of "The N. Y. Dairymen's Association," Little Falls, New York, thus speaks of dairying in that State:

"About the year 1862-'3, Alanson Slaughter, of Orange county, N. Y., conceived the idea of adapting the associated system of butter-making. He arranged his factory with pools of flowing spring water for reducing the temperature of the milk, which he set in deep and narrow cans. This was the first butter factory that had been built on the continent, or, indeed, in the world. His plans were original and novel, and as the choicest butter was made under his system, it was the commencement of the most important improvement in butter-making hitherto known in America.

"The system has been carried into Sweden and Denmark and other parts of Europe, and wherever planted, whether in the old or new world, has been the means of raising the standard of butter, and promoting its consumption in a marvelous degree.

"In 1862 the butter product in the United States was about 500,000,000 pounds, of which we exported about 30,000,000. To-day our annual product is estimated at from 700,000,000 to 1,000,000,000, of pounds, and we export scarcely anything. Butter factories have been carried into many States, and, although the plan of setting milk has been varied in regard to deep or shallow vessels, it would have been impossible to have developed this interest to its present vast proportions

if the associated system had not been inaugurated and applied to this branch of the dairy.

"It promoted an inquiry and desire for better things, and consumers, as they get a taste of the 'golden appetizer,' with its fine grainy texture and rosy aroma, become fond of it beyond measure, and they stimulate manufacturers to put forth their best efforts for perfection, by paying extraordinary prices for a 'fancy article.'

"In 1863-'4 the associated dairy system had become an established fact. Somehow the impression became general among the farming community that the dairy was reaping enormous profits.

"An intense interest prevailed, not only in New York, but in Ohio, Vermont, and other States, to obtain knowledge on the subject, and this led to the inauguration of the 'New York State Cheese Manufacturers' Association.' A meeting was called at Rome, January 4, 1864, and the attendance was so large that it filled the largest hall in that city, delegates being present from several States.

"The lesson which our dairymen are learning to-day is, that there is a difference between speculative theories and sound practice. We have learned the reason for many dairy operations, and these have been so well expounded from time to time that our cheese-makers have become better grounded in the science of the dairy, and are more intelligent than the great mass of practical dairymen in Europe.

"But there are some things concerning the care and preservation of milk that may be placed to our credit. The cooling and aeration of milk for its better flavor and condition is ours. Mr. Foster, of Oneida, New York, was the first to discover that the odor of putrefying animal matter, like that of a dead horse, may taint the milk in the bag by being breathed by the cow while at pasture. The microscopical investigations of Prof. Law, of Cornell, were the first to show how vegetable organisms may be transmitted to the milk from the water which cows drink to slake thirst. Mr. Truman, of Chenango county, was the first to discover that other fat than that obtained from the milk may be substituted for it in cheese. The late Gail Borden, of White Plains, New York, was the first to show how milk may be successfully eliminated of its water or condensed. He was an original thinker and investigator, whose name next to Jesse Williams will go down to posterity as the inventor of the grandest improvements in connection with the dairy known in any age of the world. The preservation of milk in all its integrity for long periods, before Mr. Borden's time, had been attempted, but without

success, and eminent chemists and scientists had pronounced the condensing of milk with its cream unseparated an impossibility. Mr. Borden persevered, inventing elaborate and complicated machinery, entirely original, for the purpose, and at last his efforts were crowned with success. Thousands of our soldiers during the Rebellion—thousands upon shipboard—in cities and upon the plains, have called down blessings upon this man for the benefaction of securing to them the luxury of pure milk—milk which could not otherwise be had. If the lives of children saved in our cities by the use of Borden's condensed milk be taken into account, we shall scarcely be able to estimate the value of his labors. His inventions and processes have been carried into Europe, and he is recognized in history to-day as one who has done an important service for humanity.

“Mr. Slaughter, of Orange county, was the first to adopt the associated system of butter-making, and to apply the deep setting of milk in cold water for getting the cream. This was an important step toward progress. The Swedes and Danes were the first among European nations to copy the American idea of butter factories and the setting of milk in cold water; but Sweden, with her scientists under royal patronage, was not content simply to copy, and to Sweden belongs the credit of first demonstrating that cream will rise rapidly and perfectly when the milk is reduced to near the freezing point in ice water.

“This principle has been a surprise to the butter dairymen of America, and is another step in the progress of butter dairying.

“Mr. Hardin, of Kentucky, is entitled to credit for a modification of this system, in which the air is cooled in refrigerator boxes which are used for setting the milk; and he claims as an improvement the covering of the milk and the exclusion of the air while the cream is rising. There can be no doubt but the cold theory is the true one for making butter. It arrests decomposition from the start, and the fine quality of butter made by this plan is proof of its merit.”

In 1840 the dairy product in the State of New York was estimated at about ten millions of dollars; to-day it is clearly worth over one hundred millions of dollars, and *towers above all other agricultural interests combined.*

In Kentucky the dairy business is in its infancy; a few small private individual dairies are all that this “land of the blue-grass” can show, notwithstanding the fact that the richest milk and butter in the world, and the best breeds of cattle, are found in this State.

The dairy business, properly conducted on the co-operative plan, as it is now followed in New York, Ohio, and other Northern States, and in Europe, could be made to excel every other branch of agricultural business, and bring a revenue into this State greater than the combined values of all the clean cultivated crops now grown within her borders.

Probably no portion of the world can excel Kentucky in furnishing the elements needed by cattle, from which are produced the best of cheese and butter, and nowhere is the climate better adapted to the making of these products in their greatest perfection. The Blue Grass Region, the mountain counties, the coal series, "the barrens," and the quaternary deposits of Jackson's Purchase, are all well adapted for this branch of agriculture, which will at no distant time in the future be the first and leading industry of profit in the State.

Kentucky can easily sustain a dairy population greater than that of New York, Massachusetts, or Ohio, and produce a yearly product of not less than \$150,000,000 worth of milk, butter, cheese, and the necessary calves, beeves, and hogs attached to this industry; and we will now predict that the census of 1900 will exhibit the dairy values of Kentucky to be over \$150,000,000 annually, and equal to those of any State in the Union. All we need to take the lead in this profitable industry is skilled labor and capital, turned into the right direction, and further railroad facilities, whereby the products can be easily carried into the markets of the world. Kentucky should to-day export of butter, cheese, and milk not less than \$50,000,000 worth per year, instead of about that many thousands. As the plantation system of farming is broken up, and the large tracts of land subdivided, the labor of the country people will change, and garden farming and dairying take the place of the old systems that prevailed in times of slaveholding. With this change will come greater wealth and prosperity among the laboring classes of our country population, and an immense growth of the manufacturing interests of all kinds in the State.

BEE CULTURE.

Previous to the civil war almost every farmer's house had an apiary of from one to twenty hives of the common black bees, and honey was to be found upon the table of nearly all the well-to-do planters. No persons then followed bee culture as a business, but simply as an adjunct to their garden and orchard profits—a small bonanza that gave its stores free. To work without wages and feed themselves was a privilege granted to the busy bees by their hard task-masters, who would sometimes wantonly sacrifice whole colonies in order to “rob the hives,” and not be stung by the enraged insects. During the war most of the bees were allowed to perish, until there was not one hive in fifty left, on an average, in the State.

Of late years, however, a new impetus has been given to bee culture, and great improvements have been made on the old system by the introduction of the Italian bees, and also by the use of improved hives, artificial swarming, movable comb, mel-extractors, and winter-feeding. Some few persons are now pursuing bee culture as a separate industry, and find it very profitable; others connect it with poultry and fruit farming, and find the three pursuits to go well together, neither one greatly interfering with the other, and the three combined producing satisfactory profits. No part of the Western States is more propitious to honey-making than Kentucky, both as regards climate and the natural plants and flowers from which bees feed and gather honey. In the early settlement of the State, the pioneers found in the hollow trees of the woods honey enough for their home use, and the “cutting of a bee tree” created quite a gleeful time among the young people. The native bees were all of the common black variety, which is still the principal stock, although among bee fanciers the Italian variety is greatly preferred. The rapid growth of our cities creates an increased demand for honey every year, and probably this will continue for more than a generation to come.

The plants, trees, and shrubs that supply honey for bees in this State are almost innumerable. It will not be amiss, however, to mention a few of the principal ones in the order of their blooming.

Sugar Trees.—These afford sap in January and February.

Red Maple.—The February thaws bring out flowers and give ample supplies of food for bees, and induce an early exodus from the hives. This tree is found in great numbers in every section of the State.

Wild Plums.—Bloom from the 10th of March till April.

Domestic Plums and Peaches.—From 15th of March to 15th of April.

Dogwood and Spice-wood.—From 20th of March to 20th of May.

Sassafras, Raspberries, and Redbud.—From 25th of March to 1st of May.

Pears, Cherries, Gooseberries, and Currants.—From April 1st to May 15th.

Apples, Wild Crab-apples and Wild Cherries.—From April 10th to May 30th.

Dewberries and Poplars.—April 15th to May 30th.

Willows, Poplars, and Black Haws.—May 1st to June 1st.

White and Red Clover and Lucerne.—From May 1st to September.

Black Gum, Locust, and Sweet Gum.—From May 1st to May 30th.

Blackberry.—A profuse honey-bearer, from May 1st to May 30th.

Holly and Linden.—From May 15th to May 30th.

Buckwheat and Wild Flowering Weeds —From May to October.

Turnips and Mustard and Cabbages.—May and June.

Persimmons and Grapes.—May and June.

Catnip, Horchound, Sumac, and Wild Peas.—May, June, and July.

Cow-Peas, Corn, and Sorghum.—From June 15th till frost.

Honey Dew on Trees —From June to November.

Boneset, Butterweed, Asters, and Pinks —July to October.

Golden-rod and Garden Flowers.—July till frost.

Fruits of all Kinds.—From May to December.

These are only a part of the honey-producing plants of the State from which bees gather their rich stores.

Mr. Langstroth, a practical bee fancier of Tennessee, who is extensively engaged in bee culture, in a communication to the Bureau of Agriculture of that State, gives the following points of superiority of the Italian over the native bees:

"1. The Italian bees gather freely from the second or seed crop of red clover, and from other sources of forage not frequented by the common bees. In regions where late summer or fall forage is scarce, this will often make the difference between a good profit and a heavy loss.

"2. The pure Italian bees are much more peaceable than the black bees. The assertion, however, which has been made by some, that they will not sting, is not true; and the crosses between them and the black

bees are far more difficult to subdue, if once enraged, than the black bees.

"3. Italian bees gather much larger stores of honey than the black bees. Dzerzon, the great German apiarian, after many years' experience, says, that the profits of his apiary have been doubled since their introduction; and we have received numerous statements showing that colonies of these bees have in this country secured a generous living, and often a surplus, where common stocks have not gained a sufficiency.

"4. The Italian queens are more prolific, and keep their brood more compactly in the combs, than black queens, and their swarms are usually earlier and longer than those from black colonies.

"5. In opening a hive an Italian queen is much more readily found than a black one, not only on account of her brilliant color, but because the Italian bees are much more quiet on the combs than the black ones, and the queen is less disposed to leave the comb for the bottom board or sides of the hive.

"6. Italian bees are far more inclined to supersede their queens, when past their prime, than the black bees, and colonies are therefore much less liable to become weak and queenless.

"7. The Italian bees are far less disposed to rob than the common kind. The importance of this peculiarity in an apiary where movable comb hives are used, will be readily appreciated.

"8. The Italian bees defend their hive against robber bees, whether black or Italian, much more successfully than the black bees. In opening a large number of full stocks and nuclei, during several seasons from April and November, we have not lost a single colony from robbery. The experience of Dzerzon on this point fully agrees with our own.

"9. The Italian bees protect their combs from the ravages of the bee moth much more effectually than the black bees.

"10. The Italian bees cling much more tenaciously to their combs than the common bees, so that in handling the comb the young bees which cannot fly do not, like black ones, drop on the ground or upon the person of the operator.

"11. When the position of a colony is changed, the Italian workers acquaint themselves with their new location much more readily than black bees, thus greatly facilitating many important processes in the practical management of an apiary.

"12. Italian workers are much longer lived than black ones, and the queenless colonies therefore do not become so rapidly depopulated.

"13. Colonies of Italian bees can be united during the working season with far less quarreling than would be incurred in uniting black ones. The first cross between the Italian and black races is far superior to the black bees, which are improved by any mixture of Italian blood. It may also be added that the Italian bee is less subject to casualties and disease than the black bee."

Mr. W. L. Bense, of Jefferson county, Kentucky, who has imported Italian queens for several years, agrees with Mr. Langstroth that the superiority of this stock for the climate of this State will eventually cause it to supersede all others. He further states that the Italian stock will, under any ordinary circumstances, clean the worst infected hive of moths within three days.

The honey supply, like that of sugar, may be extended almost without limit before it falls below the price of profitable production.

In the winter season it is necessary to protect the bee-hives from the cold winds and snows, and occasionally to feed the bees whose hives are deficient of a full supply of honey for winter consumption. The patented "non-swarmer hives" and the mel-extractor add greatly to the profits of bee culture, since by their use the swarms can be easily kept at work, and the comb restored for use when the honey is extracted. There have been several excellent works written within the last few years on bee culture; one of the best of these is by Mr. L. Adair, a citizen of Hancock county, Kentucky. In order to show the profits of bee-keeping and the extent of the business in some parts of the country, I will mention that the North Carolina reports show that over \$2,000,000 worth of honey and wax was sold in that State last year. Mr. J. S. Harbison, of California, has six apiaries, from which he sold ten car loads of honey, weighing over 200,000 pounds. Dr. T. B. Hamlin, of Davidson county, Tennessee, sells annually over 10,000 pounds of honey from about 350 hives; and in Kentucky there are several bee fanciers who annually show profits relatively equal to any other industry in the land.

In the management of bees much of success depends upon the ability of the bee-keeper to control the swarming impulse. If increase of stock is desired, by far the best plan, probably, is to make artificial swarms. This may be done in several ways. If empty combs can be had, a very good plan is to take about four combs containing brood and adhering bees, and put them in a hive on a new stand, giving them a queen, or a queen cell, and filling the hive with empty combs. Such a colony

would build up very rapidly. The bees may all be taken from the hive, or from three or four, as the circumstances may dictate. Another way, and a very good one, is to take one comb of brood from each of several hives, and thus fill the new hive. The bees that will hatch out will make the new stock very populous in a short time. Put empty frames, or frames containing combs, in the hives from which the bees are taken. In this way a very large increase may be obtained, and the stocks are kept strong. Care should be taken not to allow queenless stocks to build drone comb.

If we want to get the largest yield of surplus honey, we do not want our bees to swarm at all. We want to keep the stocks strong in numbers, so that they may avail themselves of the honey harvest. There is no question of more importance than this: How can the swarming impulse be restrained? In this, as in many other things, prevention is better than cure. Two things are necessary to prevent bees from swarming. The first is to give them room for breeding and the storing of honey. If they become crowded, and forage is plenty, they will be almost sure to swarm. The second thing necessary to prevent swarming is the proper shading and ventilation of the hive. The hive should be ventilated at the top, inside of the outer caps or covering. In hot weather two or three inch holes, covered with wire cloth, will be sufficient. Bees will rarely want to swarm if they have sufficient room, and the hive is not too hot. When the swarming impulse once takes possession of a stock, it is not very easy to control it.

It is said that bees will be satisfied if allowed to swarm, and they are put in a new place and their combs given to them, all queen cells being first removed.

To hive a swarm, when in an accessible place, is a very simple and easy operation, when one knows how to do it. Set the hive conveniently near, and with a dipper, or any other convenient vessel, dip the bees up and pour them down at the entrance of the hive. This must be done very quietly and gently. One should never be in a hurry when handling bees. You will be likely to get the queen among the first bees removed from the cluster, as she is usually in the lower part of the swarm as they hang on a tree, or on whatever they may have settled. If you get the queen into the hive the bees will be sure to follow. As soon as the bees are all in, or even on the hive, it should be removed to where it is to remain, before any of the bees have marked the location and gone away to the fields. To prevent the swarm leaving the hive, give them plenty of shade and ventilation.

The people of our State have only to give bee culture a trial to become convinced that it can be made a most profitable auxiliary to every farmer's income.

POULTRY.

The breeding of domestic fowls has been a recognized industry from the earliest ages of man's history. Poultry has contributed, by their eggs, flesh, and feathers, to supply as many articles of luxury, as well as necessities, as any other class of animals. In Asia, Europe, and America, great attention has been given to breeding fowls, in order to produce stocks of the different classes suited to furnish the needs of the different phases of man's civilization. Probably this industry was as well understood and as successfully pursued by the ancient Persians, Egyptians, Greeks, Romans, Chinese, Japanese, and Hindoos as it is to-day, and the people of those days, in each of these countries, were as well supplied with eggs, feathers, and dressed fowls as they are at present. The chickens, geese, guineas, peafowls, ducks, pigeons, &c., were common throughout the Eastern Continent as far back as history reaches, and long prior to the discovery of the Western World by Columbus, the nations of Europe looked for their greatest luxuries in food to the poultry-yard.

Poultry, too (the turkey excepted), came over with the early settlers of our American colonies, and have been the intimate associates of our people ever since. They constitute an important part of the luxury of our tables, both in their flesh and eggs, the aggregate commercial value of which, were it accurately reckoned, amounts to millions of dollars annually. The poultry literature of our country is voluminous, both in books and various agricultural periodicals, to which those in search of information may readily refer. As a general remark, it may suffice to say, that importations from foreign countries, of various breeds of them, have been frequent and of rare quality, both in the estimation of the economist, who propagates them for profit, as well as the amateur, for the gratification of his taste in their selection and exhibition. Poultry societies have become numerous throughout the land, and the annual exhibitions of their various specimens have been marvelous in excel-

lence, beauty, and variety. The cultivation of the finer varieties has arrested the attention of men and women of taste, wealth, and refinement to such an extent that the perfection of our poultry may even be classed among the fine arts of animated nature, and challenge competition with any portion of the universe.

The climate and locality of Kentucky is well adapted to poultry-raising, and nowhere do fowls come to a higher degree of perfection. The women of the country are almost the only poultry-raisers in the State, yet the "pin money" which comes from this source, over and above the home consumption, forms no inconsiderable sum every year.

Henneries, such as exist in France, Germany, England, and parts of the United States, if established and duly managed here, could no doubt be made fully as profitable as they are in those countries. Care, attention to feeding, and cheap houses for their comfort, is all that is required to make fowls pay a larger profit on the investment and labor than almost any other branch of farm work.

We have no means of knowing the number of fowls raised in the State, but we know that they count up high into the millions; and if ten times as many were produced, they would pay well. The great dread with the farmers of chicken cholera has prevented many from engaging more extensively in this calling. As yet there has no effectual remedy been discovered for this disease; but a free use of wood or coal ashes, and carbolic acid and sulphur about chicken houses, has proven a good preventive.

The growth of our towns and cities creates a demand for more eggs, feathers, and fowls, and this demand must be met. It behooves our farmers to give more attention to this and other "small industries," if they would thrive and make the greatest profit with the least labor. The best and most successful way to manage and make fowls pay is to scatter them over a large range in fields and orchards. Common rail pens, ten or twelve feet square, covered six inches with dirt or corn-stalks, and having the sides well thatched with stalks or straw, answer well for hen-houses. These should be some eight feet high, with the nests well protected from the drop of the roost. Such houses will accommodate two roosters and twenty-five hens, and should be removed every two or three years, in order to destroy vermin and give health to the poultry. Eggs, dipped when fresh into lard or oil, and set on the smaller ends, and kept in a cool place, will keep fresh for over six months.

PISCICULTURE.

The hatching and rearing of fish has become in Europe and America an industry of great public interest. It began some fifteen years ago in Massachusetts, since which time it has extended to nearly thirty States. France, Germany, Italy, Spain, England, and most of the other European Governments have also established "Fish Commissions," and are having their creeks, rivers, and lakes re-stocked with ever known variety of game fish. The appropriations of the different American States vary from \$3,000, the smallest (in Kentucky), to \$15,000 in Massachusetts, and about \$20,000 in New York. The United States Government also established a Fish Commission in 1872, with an appropriation of \$15,000, which has been since considerably enlarged. Massachusetts, Connecticut, and New York have placed many millions of shad, salmon, and trout in the streams of the New England States and New York, which have grown to eatable sizes, and have caused such an increase in the catch of the fishermen that the price of first-class fish has fallen from 12 cents per pound to under $3\frac{1}{2}$ cents. Wisconsin, Michigan, and Ohio have placed white fish, trout, salmon, &c. (all hatched by artificial means), into their creeks, rivers, and lakes, until now the catch is so great that even the Louisville and Frankfort, Kentucky, markets can procure these fish, and sell them at retail at from 6 to 7 cents per pound. The United States Commission began placing shad-fry in the creeks of Western Pennsylvania three years ago, and now shad are caught in the Ohio river, at Louisville, weighing over three pounds each.

The last Legislature of this State formed a Fish Commission, with an appropriation of \$3,000, to be composed of one member from each Congressional district, who were to act in connection with the United States Commission, as far as possible, and also to establish hatching-houses, &c., in Kentucky, with a view to re-stocking the streams of the State with the best varieties of game fish. The appropriation was so small that the Commission made only one hatching-house—in Jefferson county—at which they have hatched several thousand spawn. A misfortune, however, overtook this house, which killed tens of thousands of spawn recently hatched, which will make it prudent to change its locality. This was caused by a large rain of several hours, which so charged

the water with mud or some mineral or vegetable substance as to suffocate or poison all the little spawn at one fell swoop. We think, when a skillful examination is made, that it will be found that these fish were killed by the oil or mineral washings that come from the Devonian black shale, which is adjacent to where the fish-house was established. The report which this Commission will make to the Legislature will no doubt explain fully the cause of the difficulty, as well as give much useful information for future guidance in the State. There can be no doubt whatever, that if the fish laws are enforced, and the Legislature will supply the Fish Commission with the necessary funds, that every acre of creek, lake, river, and pond area in the State can be made as valuable, in producing food for the people, as the same number of acres used in clean cultivated crops. Then any man who has a spring branch, creek, or pond can have a full supply of choice game fish for family use at all seasons of the year. What we particularly want is a full supply of spawn of such fish as will do best in our ponds, lakes, and rivers, without too much regard for those superior kinds that annually make their exit from the rivers for the purpose of seeking the salt water of the Gulf of Mexico or the ocean. It takes fish three years from the egg to mature so as to become first-class food, and experience has proven, beyond a doubt, that, of every one hundred eggs placed in a hatchery, ninety spawn can be brought into a condition suitable for transferring into the various streams, lakes, and ponds of the State, and also that they can be as easily reared and domesticated as hogs or poultry, at one fourth of the cost per pound.

FORESTRY—VALUE OF TIMBER.

Probably no subject can arise of more importance to Kentucky than forestry, and the preservation of the trees that now so abundantly adorn her magnificent woodlands. Over sixty per cent. of the lands in this State are as yet covered by forests of the most magnificent timber growing in the Ohio Valley. A partial detail of these timbered tracts will be found under the heading of the different counties. The

varieties of trees grown include every species usually found in similar climates and latitudes in the north temperate zone. No complete list of the trees found in Kentucky can as yet be given, owing to the want of a proper examination and study of our forests, but enough has been done through the instrumentality of the Geological Surveys to foreshadow good results, both economic and scientific. The most common trees in our forests are the white oak, black oak, chestnut oak, pin oak, burr oak, Spanish oak, post oak, laurel oak, red oak, barren oak (black jack), water oak, and several others of the oak species, walnut, butter-nut, hickory (black, white, and pignut), beech, birch, maple, sugar tree, cherry, chestnut, poplar, gum, ash, linden, sycamore, cottonwood, pecan, elm, buckeye, hemlock, spruce, white and yellow pine, arbor vitæ, cedar, persimmon, locust, cucumber tree, umbrella tree, hackberry, mulberry, willow, hornbeam, catalpa, wahoo, dogwood, holly, plum, crab-apple, sassafras, redbud, sumach, ironwood, leatherwood, papaw, juneberry, haw, and many other kinds of both hard and soft wood. Various vines, creepers, ivies, witch hazels, hazelnuts, spice-wood, whortleberry, sage bushes, briars, and innumerable other kindred plants, form the undergrowth of the woodlands. Of the value of the different kinds of trees for purposes for which they are suited I will not speak here, for they are too well known to require special mention.

The Geological Survey, now being made under the able management of Prof. N. S. Shaler, will give a detailed statement of the forestry of the different sections, which will be found in his forthcoming reports, to which the reader is especially referred for an extension of facts on this subject, as well as on all matters relating to the mineral, geological, and topographical condition of the State. In relation to our forests Prof. S. says:

“Hitherto all the descriptions given of forest timber have been very indeterminate, as far as concerns the size and number of the different kinds of trees on given areas. In laying out a plan for the work of the Kentucky Survey, it seemed desirable to take an account of our forests in such a fashion that it would be possible to obtain precise statistics concerning every important feature capable of being accurately measured. It was obviously necessary to count the number of trees to the acre on several different exposures in each district, taking account of the different species, so as to show their relative proportions and average size. Mr. Crandall has been charged with the execution of this plan, and he has perfected it in several essential particulars. His

method of indicating the distribution of the species of trees on different slopes of the same hill is entirely original, and expresses the facts in an admirable manner. It is in the plan of the Survey to carry this same system of delineation over the whole of the State, with a view to give a record of the present condition of our forests, in order that their changes in coming time may be determined, and especially that their economic value may be properly appreciated. I am satisfied that, by properly husbanding our timber resources, they will in fifty years become one of the most important of the varied sources of wealth to our State. A large part of the eastern coal field of Kentucky is not tillable land. The lofty and rugged ridges between the valleys are natural nurseries of timber. While they will not serve for other forms of cultivation, they will yet do admirably for the raising of many of the most valuable woods for our various arts. So large a part of the Valley of the Ohio is arable land, that the future sources of timber for its use are very limited. They will be found in the lofty ridges of the Apalachian Mountains, where the steepness of the slopes will forbid plow tillage.

"I deem it quite likely that within the time of the next generation these hill lands will become as valuable for timber-raising as the average lands of the valley are for other forms of culture. They are naturally suited to all the most valuable woods of the Mississippi Valley. At the present valuation of black walnut, an acre of this timber forty years old, growing as thickly as it is able to stand, should be worth several hundred dollars; of hickory and locust of second growth, the value is about as great. There are few crops of the ordinary soil which will give as great average returns when labor and interest are deducted. A very great advantage in our Kentucky forests is the comparative immunity from fires. In most valuable timber regions this danger is so great as to reduce the value of such lands as investments. In many thousand miles of travel through the timbered districts of Kentucky, I have never seen an acre of forest seriously damaged by fire. In the present state of our American life, when men are hardly willing to wait for the yearly harvests to mature, it seems almost too much to hope for the far-seeing thrift that will look forward to fruits to be gathered at the end of forty years; yet these enterprises that take hold on a distant future will become more attractive, with a growth of capital and an increase of confidence in life. But in fact a large part of the value of such growths as our forests would give when artificially planted would be immediate; at five years young hickories have a value; and the trees

removed by trimming out each year should pay an interest on investment. The black locust becomes valuable in ten years, or nearly as soon as a pear orchard, and for thirty years thereafter should give a steady supply of timber. With each succeeding year these woods become more and more valuable as the original forests become stripped of their scanty supply. The best black walnut is already priced with mahogany in Europe, bringing several dollars per cubic foot. The abundant water-ways of the Ohio Valley will always make its regions of permanent forests of peculiar value.

There is another and most important reason for retaining the forest covering of our eastern hills. The surface of that country is so rugged that nearly seven eighths of its area lies in slopes of great steepness. If stripped of their timber, the water will not lie on these slopes much longer than on the house-tops.

By the forest covering a large part of the water is retained as by a sponge, and is allowed to filter away slowly into the streams. A heavy rain of say five inches in depth, falling within say two days, will have at least one half of the precipitated water retained for some days in the mat of decaying leaves of the forest, which would otherwise be precipitated at once into the streams. To strip away the forests is to double the amount of water thrown at one stroke into the rivers. A glance at the map of the Big Sandy or Chatterawha Valley will show that this stream has a great many branches, and gathers the water from about five thousand square miles of mountainous country. Every part of this area is made up of narrow valleys and steep hill-sides. As it is, the floods of the Lower Sandy rise to about fifty feet above the low-water stage of the river, and are formidable in their violence. If the country should ever become stripped of its timber, the consequences would be disastrous in the highest degree. Some of the valleys of a similar character in Europe, which have been recklessly stripped of their timber, have become almost devastated by the violence of the floods. There are several such cases in France where the soil has been in good part stripped away since the timber was removed, and the government has been compelled to intervene in order to restore the forests. When this restoration has been accomplished, an immediate change for the better has been brought about. Thus we see that there are two good reasons for endeavoring to retain the forests of the Big Sandy Valley. Firstly, that they may remain a source of supply for valuable timber, which each year must enhance in price on account of the increasing population of the Ohio and Mississippi Valleys; secondly, on account of the safety of

the agricultural and mining interests of the region which must be located along the valleys, and thus be in great danger from any increase of the floods which now sweep them.

"It may be urged in addition, that the best interests of this valley demand that the streams, even to their second and third branching, should be used as a means of bringing out the mineral and timber stores. This will require the extensive use of locks and dams; and these structures, already difficult to construct on account of the violence of the floods, would become quite impossible if their force is increased, as it will be by the destruction of the forests. The mineral region of Eastern Kentucky has a precious heritage in its forests, ores, and coals. All the skill of legislation, and all the discretion of private enterprise, should be directed to securing the best products from these resources, avoiding destructive waste. This cannot be done except by preserving the forests without great reduction from their present area. If the State, or the counties thereof, still own large tracts of forest timber, it would be clearly in the line of true policy to retain those areas as public domains in the interest of coming generations. Throughout Switzerland and other parts of Europe the communal forests, rarely large in area, are the most precious of the public domains. From them the citizens derive in many cases sums so large as to form a considerable element in their private revenues. Every county in our mountain districts that will put aside as public land ten thousand acres of forest, worth to-day as many dollars, will, at the end of a century, have a princely domain. There is, in a word, no gift that the present generation can make to the future so precious and so noble as untouched areas of our magnificent forests. For us it requires little forbearance to spare what will be to them a most precious heritage."

Whatever has here been said by Prof. Shaler is equally applicable to the forest of other parts of the State, with slight modifications.

We have been favored by Mr. John R. Procter, Assistant Geologist of the Survey, with the following clear and practically valuable article regarding the timber and forestry of the State, which was first published in the *Kentucky Yeoman* during the month of April last:

"Among the subjects deemed worthy of especial study at the recent International Exhibition in Philadelphia, as bearing directly upon the interests of the people of Kentucky, the markets for hard-wood timber took rank. As the information derived may be rendered less useful by delay in publication, and the Survey is frequently asked for facts bearing

on this subject, I am instructed by Prof. Shaler to give to your paper a few leading facts in advance of their regular publication by the Survey. I was met with an earnest desire on the part of the representatives of European countries for an exchange of information, and I found that many of them were seeking for new sources of supply. In many European countries, chiefly in Great Britain, Belgium, Holland, France, Spain, Portugal, and Italy, the home supply is totally inadequate to the largely increasing demands; nor will the forests of Europe supply this demand. The forest area in Europe is estimated as follows:

“In Russia the forests cover 40 per cent. of the whole area.

“In Norway the forests cover 39 per cent. of the whole area.

“In Sweden the forests cover 35 per cent. of the whole area.

“In Austria the forests cover 27 per cent. of the whole area.

“In Prussia the forests cover 21 per cent. of the whole area.

“In France the forests cover 16 per cent. of the whole area.

“In Italy the forests cover 15 per cent. of the whole area.

“In Great Britain and Ireland the forests cover 7 per cent. of the whole area.

“In England proper the forests cover 5 per cent. of the whole area.

“In Holland the forests cover 7 per cent. of the whole area.

“In Portugal the forests cover 4.4 per cent. of the whole area.

“In Spain the forests cover 5.5 per cent. of the whole area.

“We can best appreciate the scarcity of timber in Europe by a comparison with Kentucky. The population per square mile is—

“In Belgium, 447 persons.

“In Great Britain and Ireland, 227 persons.

“In Holland, 290 persons.

“In France, 186 persons.

“In Kentucky the area of woodlands is about 60 per cent. of the entire State, and the population but 35 persons to the square mile; yet in portions of the State a scarcity of timber is beginning to be felt.

“The great increase in the consumption of timber has caused serious apprehensions lest the European supply should fail, and stringent forest laws are being enforced with a view to the better conservation of the forests. These countries are taking warning, before it is too late, of the fate of such countries as Persia, Asia Minor, and portions of Italy, once fertile and populous regions; now, owing to the long-ago removal of their forests, almost barren deserts; streams dried up, and the lands so denuded that they are incapable of reproducing the woods once

covering them, and are irreclaimable for the use of man. Notwithstanding the most stringent efforts to prevent, the drain upon the European timber must increase; nor is it probable that the well-directed efforts to promote tree culture will replace the waste.

From Sweden, in 1874, there was consumed for fuel, burned principally as	Cubic feet.
charcoal	890,000,000
For carpenter work	110,000,000
For exportation	150,000,000

Total	1,150,000,000
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"The value of the forest exportations from Russia, in 1871, was 16,026,000 roubles (about \$13,300,000), of which more than one third went to England. Large as is the area of the Russian forests, much of it is unproductive and inaccessible, and the central and southern portions of that Empire are so destitute of timber that before many years the amount now exported from the north will be required at home. The annual value of the products from the forests of the German States, principally owned by the government, is about \$61,000,000. Austria exports timber to the amount of 75,000,000 francs per annum.

"In France the consumption of timber, in 1862, was estimated at 212,000,000 cubic feet for building and manufacturing, and 1,588,500,000 cubic feet for fire-wood and charcoal. The product of forests of France was then 70,000,000 cubic feet for construction, and 1,300,000,000 cubic feet for fuel. Thus 570,500,000 cubic feet must have been supplied from outside the boundaries of France. The importation of timber into France rose from 9,000,000 cubic meters, in 1855, to 31,000,000 cubic meters (about 1,116,000,000 cubic feet), in 1865. The demand of wine cask staves in France, in 1871, required the consumption of 136,000,000 feet of white oak.

"Great Britain imported timber, in 1873, to the value of \$140,000,000, principally from Canada and the Baltic. Enormous as is the consumption of timber in Europe, it must increase in an increased ratio. The present forest area of Europe cannot be diminished without detrimental results. The clearing of timber, more especially off of slopes and untillable lands, causes the lessening of the depth of streams in summer, the diminution of the rain-fall, the filling up of river channels, destructive torrents, the forming of sand-bars, and destruction of harbors at the mouth of streams, and many other harmful results. It is safe to reckon that the exportation of timber from European forests will gradually diminish. To North America Europe looks for a future supply, espe-

cially of hard woods. Can this supply be depended on, is a serious question? The *destruction* of timber in this country is much greater than in Europe. It is beyond computation. The value of logs, sawed into lumber, increased from \$43,000,000, in 1860, to \$103,000,000, in 1870, an increase disproportionate to the increase in population. The consumption of wood in the United States for fuel, charcoal, brick and lime-kilns, &c., is greatly in excess of the consumption in Europe for like purposes.

“In Switzerland, the consumption of wood for all these purposes, including even house building and furniture, does not exceed two hundred and thirty cubic feet, or less than two cords per year per household. The Commissioner of Forests in Wisconsin, in 1867, estimated the consumption at fifteen cords for each household for fire-wood alone—eight times the amount used in Switzerland for all purposes. The destruction of timber for fences is greatly in excess of what it is in Europe. A rough estimate of the timber required in the fences of Indiana gives the enormous amount of 15,550,000,000 cubic feet. In Kentucky it is as much. Over one million and a half of trees are destroyed annually in Pennsylvania to supply the railroads of that State with cross-ties. In 1869 the saw-mills in Minnesota, Wisconsin, and Michigan cut 3,311,372,255 feet of lumber, and to obtain this quantity, 1,380 square miles of pine timber was removed. Taking the area then remaining, and allowing that the annual consumption would not decrease, it would require from fifteen to twenty years from 1869 to cut and send to market the timber remaining in those States. The pine regions are almost exhausted in Pennsylvania. The second growth on these cleared pine lands is an inferior wood, unfit for use in the arts, and inferior for fuel. The total export of forest products from the United States amounted to \$21,766,620 in 1872, against \$15,934,414 in 1871. It has been steadily increasing since.

“Great as is the drain upon the forests from the above *legitimate* causes, it is as nothing compared with the wholesale destruction by the pernicious system of “clearing” by deadening the trees, so prevalent throughout this country.

“Dr. Geo. B. Emerson stated at the last annual meeting of the Massachusetts Board of Agriculture, that ‘in twelve years, at the rate that the forests have been cut down for many years past, they will be all gone.’ The efforts to retard this wholesale destruction, and supply by planting the enormous waste, are so few and feebly directed that, for some years at least, they will hardly effect much.

"It is therefore evident that Europe cannot long depend on obtaining a supply from this country. It would seem that the best policy would be to reserve the timber for the coming demand. This is only true respecting the younger growth. After trees have reached maturity, the wiser plan is to send them to market, thus making room for the development of the younger trees, taking care that such are protected in their growth. Hoping that an appreciation of the present and prospective value of timber may aid in arresting the wholesale *destruction* of our forests, I give below the market prices of timber abroad, and the kinds and sizes most in demand:

"At present Liverpool is the principal English port for American timber.

"Liverpool imported 1,702,000 cubic feet of Quebec and United States oak in 1876, against 924,000 cubic feet in 1872. The best size is from 14 inches to 22 inches, hewn square; the straighter the wood and the smoother it is hewn the more salable. The best length is 25 feet and upwards. The best white oak of the above dimensions is now worth in Liverpool from 2s. 6d. to 2s. 9d., averaging about 71 cents per cubic foot in American currency. The same quality of oak sold at an average of 81 cents per cubic foot in 1876. The demand is unlimited. Fancy oak in billets suitable for wainscot is worth much more.

"*Walnut*.—Good black walnut, of suitable sizes, is worth about 3s. 6d. to 5s. 3d. per cubic foot. 144 logs from New Orleans sold in Liverpool in January last at an average of \$1 07 per cubic foot, American currency. Walnut sold in 1876 as high as \$1 44 per cubic foot, and will probably reach that price in 1877. It should be 20 inches and upward in diameter, and smoothly hewn, but need not be square, a wave of 1 to 3 inches being allowed on the edge. The best length is 15@20 feet. Fancy walnut, suitable for veneering, sells for a much higher price.

"*Ash* is in moderate demand, but tough or finely-grained wood is always salable. It should be 14 inches and upward in diameter. The length is not material, but is best 18 feet and upwards. It is worth about 2s.@2s. 6d., or an average of 60 cents per cubic foot. Fine ash, for furniture, wainscot, or parquetry floors, is worth more.

"*Bird's-eye Maple*, such as is shipped from New York, sells for 7s. and 8s. per cubic foot for prime, about an average of \$2 07 per cubic foot in American currency. The best size is 16 inches and upwards, and 12@18 feet long.

"*Hickory*, if square, about 12 inches and upwards, is worth for good quality about 55 cents per cubic foot; extra tough for handles, spokes,

&c., is worth more. I believe a satisfactory market for hickory can be had in this country. I visited a spoke and handle factory in Pennsylvania, where the hickory, purchased in the Shenandoah Valley, Va., was costing \$19 50 the cord. Such factories cannot long compete with factories established near the timber.

“*Staves.*—The dimensions of staves sold for wine and brandy casks in the European market are as follows:

	Length.	Width.	Thickness.
Extra pipe staves.	60 in.	4 to 6 in.	1 $\frac{1}{4}$ to 2 in.
Hogshead	48 in.	4 to 6 in.	1 $\frac{1}{4}$ to 2 in.
Claret.	39 in.	4 to 6 in.	1 $\frac{1}{4}$ to 2 in.
Barrel.	33 in.	4 to 6 in.	1 $\frac{1}{4}$ to 2 in.
Keg.	24 in.	4 to 6 in.	1 $\frac{1}{4}$ to 2 in.
Quebec, West Indies	42 in.	4 to 5 in.	$\frac{3}{4}$ to 1 in.

“The importation of American staves into Liverpool was 2,241 mille in 1876, against 1,556 mille in 1875.

“Extra heavy pipe from Quebec sold at \$420 per M., while extra heavy pipe from New Orleans sold for but \$210 to \$287 per M. I think that the best Kentucky white oak will rank with any shipped from Quebec. Hogsheads, heavy, sold at from £30 to £35 per M., averaging about \$168 per M. in American currency. Barrel staves ranged from \$85 per M. to \$116 per M.

“I have already occupied so much of your space that I will defer for a future letter the prices of timber in other transatlantic ports, and will also give then estimates of cost for freighting timber and staves to the seaboard, and the costs of freights to the various European ports. It is to be hoped that the improvement of the mouth of the Mississippi river will open that river to commerce, so that cheap freights can be had from there. At present, I am informed that nominal rates can sometimes be had on staves by shipping them as ballast on cotton ships. Until recently, the rates from New Orleans have been excessive for timber, averaging about 50 shillings sterling per load of 50 cubic feet, while the rate from Quebec was from 30 to 33 shillings per load. As English ships do the carrying trade, we cannot expect minimum rates of freights until we open our markets to English goods. The South and West will then get remunerative prices for all their products of forest and field.”

The immense demand for young timber, particularly hoop-poles, should induce our farmers to set aside a small piece of land (inferior

for crop purposes) for a hickory nursery. This well planted with the white and black hickory will, in seven years, if not too much tramped by stock, produce barrel hoop-poles, and in fifteen hogshead hoop-poles. These poles, if cut in winter, will sprout up again in the spring, and continue thus to grow as fast as used for an unlimited time, even many generations. An acre of land used in this way, even if valued at from \$100 to \$200 per acre, will pay better interest on the investment, counting from day of the planting, than probably any acre used for the production of clean cultivated crops. Similar results, though not so rapid, will follow the planting of walnuts, wild cherries, locusts, red cedar, oaks, and other good timber trees. Mr. Millikin, of Ohio, who has written extensively on the forestry of the United States, says: "No one ought to hesitate about planting choice sorts of timber-trees, even on lands worth \$100 per acre. Good hoop-poles for barrels are worth in Cincinnati from twenty to thirty dollars per thousand. Ten thousand such poles can be grown on an acre of ground in from five to eight years. If only half of these were spared, we should have \$125 per acre, and probably more, as the gross receipts of the first crop. Supposing five thousand poles, not cut the first crop, were left for three years, they would then be fit for hogshead hoops, worth from \$40 to \$75 per thousand in Cincinnati, or \$275 for the second crop. A hickory plantation would last forever, if only cut in the winter season, for the sprouts would always grow straighter and faster than the original trunk. Ash trees can be cultivated, on suitable land, at even better profits for carriage-maker's work." If our farmers, then, would adopt the rule, every year to take only a bushel each of walnut and hickory nuts, and plant them in the vacant spots of their woods, they would, in ten years, double the value of lands without any further labor.

COAL OIL.

Oil springs and wells have been found in various localities in the State of Kentucky. These are not confined to one geological formation, but to a greater or less extent exist in the subcarboniferous, carboniferous, Waverly, and Devonian areas. Even in the Cambrian and Silurian dis-

tricts, wells sunk have emitted large quantities of the inflammable gases which usually accompany the oil-bearing rocks. The following article, written by Prof. N. S. Shaler, the State Geologist, in advance of the remarks on the same subject, which will be found in the forthcoming volumes of his reports, will elucidate the theories of the origin of our coal oil, its extent, and other practical considerations regarding its profitable working. I give his text complete, as follows :

“ While I desire to leave the consideration of all the theoretical questions to the less limited space of my official reports, it will be necessary for me to preface the few practical suggestions which I desire to make by some general statements concerning the history of oil-bearing deposits. Out of the great mass of well digested facts concerning the conditions of coal oil which have been given to science through the labors of practical geologists, I shall only select a few very noteworthy truths which have especial bearing on our problems encountered in Kentucky. In these general considerations, I shall confine myself to the following points: first, as to the method of origin of our coal oils and related substances; second, as to the conditions of their storage in the rocks where we find them.

“ *The Method of Origin of our Coal Oils.*—It is now quite beyond question that our coal oil, bitumen, mineral wax, and other allied substances, are, quite as much as our coal beds, the products of organic life, the only difference being that the coal beds are altogether the result of vegetation that has grown, like our forests, in the air, while the coal oils and other bituminous deposits have their origin in the remains of the organic life, animal and vegetable, which had its being in the ancient seas. It is a well-known fact that any organic matter, such as wood and coal, as well as the tissues of certain animals, may, by simple chemical agencies, be transformed into oils. During the long ages when our rocks, which appear at the surface in Kentucky, were being laid down on the ancient sea floors, the sea-weeds and other living things of the ocean were heaping up their remains in the sandstones, limestones, and other deposits. Sometimes these deposits are so full of this waste of ancient life that its whole appearance is affected thereby. The Devonian black shale, for instance, that thick deposit of coaly-looking material, which is found a little above the line of the Blue or Cambrian limestone, seems to have been, in the main, formed by the long continued depositions of sea-weeds on this part of the ancient ocean bed. In most cases the process of decay has destroyed all distinct trace of the organisms whose remains have been built into our rocks; but the

chemical combinations of matter brought about through their existence remain in the rocks long after all distinct traces of the creatures have vanished.

“As far as the share of organic beings in the making of hydrocarbon compounds (coal, coal oil, &c.) is concerned, rocks may be divided into several groups, according to the amount of material available for conversion from organic matter to the class of substances akin to coal oil. First and highest among these in richness of matter suitable for making hydrocarbons we must set the black bituminous shales, such as the Devonian shale, so well known along the northern side of Muldraugh's Hill. Next to these shales the limestone deposits afford the greatest amount of substances suited to develop coal oil; and least rich in materials of that class are the sandstones and the conglomerates, *the very rocks that yield the only important supplies of coal oil which have yet been found*. This seeming contradiction we shall see through when we come to consider the conditions under which coal oil is preserved and yielded by the rocks.

“While it is clear that the coal oils and related substances of our rocks are derived from the organic matter deposited with them, it is not by any means so clear to students of the question just how the changes which converted the remains of animals and plants into oil took place. A variety of theories have been framed, differing much among themselves, but it will not be possible to discuss these several views within the limits of this letter. They are all obstinately alike in holding that certain changes, allied to fermentation, and at the same time to the alterations of matter that go on in a highly heated gas retort, proceeding with great slowness in the low temperatures of our rocks, have generated the oils, gases, and other similar substances we now find in them. There can be little doubt that this process demands peculiar conditions for its activity. What these conditions are has not yet been determined, but they are common to the whole earth, and have been brought about in all lands and at nearly every stage in geological history. All rocks laid down on the ocean floors which contain any considerable traces of organic life are likely to show the presence of these products of the natural laboratories. I am satisfied that the profitable occurrence of coal oil depends upon the rather rare conjunction of conditions which have not only favored the production of the substance, but have also at the same time favored its storage in some fashion that would admit of its being drawn off in the way required by the needs of man. I believe

the forces that produce coal oil are common, while the conditions that favor its storage and extraction are, by the rarity of their occurrence, the principal causes of the scarcity of its existence in profitable quantities. It is, therefore, of the first importance to consider the conditions that determine the retention of the coal oil, and its allied compounds in positions favorable for their utilization.

“Conditions Determining the Storage of Oil in the Rocks.”—The first point to command our attention is, that while the conditions most favorable to the production of coal oil are found in shales and limestones, it is only in conglomerates, sandstones, or very sandy limestones, that the material has ever been found in large quantities. I am satisfied that this is due to the differences in the texture or permeability of the several kinds of rocks. A limestone or shale deposit has few interstices; it is generally not easy to force more than one or two per cent. of water into the cavities of their mass. Where they are below the drainage of a country, and have never had underground streams flowing through them, they are generally quite without fissures. The fluids they contain are intimately blended and imprisoned in their mass. Our black shale, for instance, has ten or more per cent. of its bulk made up of coal oil, but this is firmly fixed within its structure by the close contact of the fine grains that make up the beds. In the process of generating the oil there seems to have been a large collection of gas which, in its long continued escape, has driven the oil before it along such interstices and crevices of the shale as there may have been, and so forced it onward beyond the beds where it originated, either to the surface where it would be washed away, or to the neighboring rocks where it might find better storage. This better storage would be afforded if in either direction, above or below the point of origin, there was an open structured sandstone or conglomerate. Beds of this character will often take five, ten, or even fifteen per cent. of their bulk of fluid into the interstices between their grains. It is true that before the invasion of the coal oil these crevices would have been filled by water, but the oil is urged away from its point of origin by the very powerful impulse of the gases which are made with it and accompany its path. The tendency is to force the oil before the water, and so secure a place in interstices of the rocks. It may in this fashion often happen that in this struggle between these fluids for the possession of the crevices in the rocks near to seats of production of oil, that the oil may obtain complete possession of extensive areas of storage.

There is yet another question of a general nature concerning the chemistry and geology of these bituminous substances which is still under debate. It is, whether they are still in process of generation within these rocks where we now find them? When we consider the continued loss that these substances have been subjected to, through natural springs, for an incalculable time, and at the same time note that the rocks whence they escape have at the present time all that they can store within their inter-spaces, we are forced to believe that it is still forming. This conclusion becomes the stronger when we consider that the rocks are continually yielding quantities of the gases which accompany the formation of coal oil. Thus, while there is still some doubt on this point, it may reasonably be supposed that the process which has created these valuable products is still going on in the rocks beneath our feet.

“ Practical Considerations.—Having now considered in outline the conditions of occurrence of coal oil, it will be possible to give a brief statement of some of our own economic problems with greater clearness and brevity than could otherwise have been possible. First, as regards the geological beds of occurrence of these soils, counting downwards. These are four in number, as follows: The uppermost is that formed by the sandstone beds which are known as the Chester sandstone, lying between the top of the sub-carboniferous limestones and the base of the true coal-bearing rocks. Next below we have the Waverly or Keokuk sandstone beds, which in Northern Kentucky are very sandy, but become in the main clayey deposits in Southern Kentucky, and in that section afford little oil storage. The third important line in the descending series is found just below the Devonian black shale, the coal black beds so common immediately north of Muldraugh's Hill. This third line of sandstone is the upper part of the blue limestone (upper Cambrian), which, in the region south of the Lebanon Branch Railroad, is changed to a blue-gray sandstone. Still further down we penetrate a bed of coarse sandstone, which is not shown at the surface at any point within the Commonwealth of Kentucky. This constitutes the lowermost oil line. On all these lines extensive traces of oil have been discovered; but all the oil as yet marketed from Kentucky comes, I believe, from the Cumberland sandstone, as it has been termed in the reports of this Survey, or the sandstone formed on the top of the Cincinnati division of the upper Cambrian. In a small part of the State there is a coarse, flinty, calcareous sandstone, lying just below the black shale, and

known as the Corniferous sandstone. In Canada, and probably other districts, this rock has yielded much oil. So far as is known to me, this rock has not afforded any strong trace of oil in Kentucky.

"I am satisfied that the limited yield of oil from a large part of the wells in our Kentucky field has been due in the main to the relatively extreme compactness of structure in our oil-bearing rocks, and not to the absence of the oil from deposits found within the State. I am, moreover, inclined to the opinion that the mistake in our explorations for oil has been in trusting to a system of small borings which, though a suitable means of exploring for oil in certain kinds of rock, is a method unsuited to our compact and little favored formations.

"It is a curious fact that, while the methods of obtaining other sources of underground wealth have been greatly modified in their nature, according to the needs of particular localities, the search for coal oil in this country has always been prosecuted in the one way that happened to be successful in the oil rock district at the outset of the industry. Great changes in the mechanical appliances have been made, but the system of boring a slender tube, the walls of which are generally much compacted by the driving of the tools, still prevails. The centuries' old experiences in the oil wells of the Rangoon district, in British India, shows that there is another method of opening wells possible—one that I believe promises a great deal, if applied in our own fields. In Rangoon (Burmah), as in several other oriental oil districts, the oil is obtained through ordinary wells, exactly like those sunk for water. In a large part of our oil districts, these wells would not have to be over one hundred feet deep, in order to attain the oil-bearing rocks. The difficulties to be encountered, besides those met in ordinary well-digging, would arise from the gas which is found in company with the oil and the flow of surface water. Both these difficulties are avoidable. The gas can be blown out of the well by a simple fan; the ordinary fanning machine, with a cloth pipe reaching to the well bottom, will probably answer the purpose of making the air breathable; while the danger of gas explosions can be guarded against by using the 'Davy Safety Lamp,' or by reflectors, so directed as to turn the sunshine down the shaft.

"A well of this description would probably cost less than the bored well, and would give an indefinitely larger surface for the percolation of the oil. If desired, short, horizontal galleries could be carried out from the bottom, making the oil-yielding surface several thousand times as

great as in the case of a bored well. I cannot help thinking that this form of trial promises much more than the further experimenting with bored wells in districts where they have been already unsuccessfully tried. If the difficulty is, as I believe it probably to be, in the extreme compactness of our rocks, this change of plan is in the line of avoidance. Where the bored wells succeed, as I am glad to say it is proved they do in several countries, of course this change of plan is uncalled for. Where they have failed, and, at the same time, a certain quantity of oil and gas have been obtained, I believe there is a fair chance of success on this simpler and older method of working by large shafts rather than by small-drilled openings. I would not advise its trial when the drill has failed to give any oil, and should doubt the result in case there was not an outflow of gas, for I believe it is to the gas we must look for the force that is to squeeze the oil through the pores of the rock to the opening of the well.

"I designed making some further remarks on this subject, as well as on the economic value of our gas wells, but I have already transgressed all reasonable bounds, and must save this matter for another communication."

Whether oil exists below the Cambrian limestone in Kentucky, is a question which yet remains to be settled. A well was sunk in the city of Frankfort near the depot, which, by drilling, passed through the different stratas of limestone of the Lower Silurian or Upper Cambrian rocks, when suddenly a large current of inflammable gas threw out the drill, and, when set on fire, burnt so rapidly that it was found (after two or three days' work in the vain endeavor to extinguish the flames) that the only plan was to plug and cover up the entire opening, and leave the inflammable gas undisturbed where nature had placed it countless ages before man's appearance on earth. The query is, did this gas come from beds of coal oil? If so, whence came the oil? Certainly not from any vegetable growth of former ages, but possibly from shell fish (mollusks) of the Cambrian period. If this is the source, it may open new fields hitherto unexplored of this valuable gift, which has been kept so long in store for man's use. That oil is contained in limestone rocks of the sub-carboniferous period becomes self-evident to any one who will examine stagnant pools in the "barren counties," where every puddle or pool of stagnant water, during the dry seasons, is covered with a distinctly-marked class of oil. It is highly probable that nature has means by which the supply of this useful article will be forever formed

or distilled by the hidden forces in the earth's great laboratory as rapidly as the stock there on deposit can possibly be used by the human family. There can be but little doubt that Kentucky contains immense deposits of oil in different sections of the State, possibly as much or more than Pennsylvania, which only await discovery to become one of the largest sources of permanent wealth known to our people. This discovery, and the consequent industries following therefrom, will certainly be made in due time, when human wants call for the unlocking of nature's great warehouse.

FUNGI, MUSHROOMS, VEGETABLE PARASITES.

TRUFFLES AND OTHER EATABLE MUSHROOMS—POISONOUS MUSHROOMS—DESTRUCTIVE FUNGI—WHEAT RUST—CORN SMUT—RYE SMUT OR ERGOT—POTATO ROT—GRAPE-VINE MILDEW—BLACK KNOT ON PLUMS AND CHERRIES—CARNIVEROUS FUNGI, &c.

The scientific investigations of natural phenomena are fast bringing to light the causes of many things which, unknown, were most mysterious to our ancestors. The microscope opens new fields of discoveries every year, and teaches us how to control many things in plant life that were a few years ago considered beyond our reach to know, and also beyond our power to govern. In their investigations, the scientists have thoroughly examined with their compound lens the minute members of families of plants known as lichens, mosses, and mushrooms, and we are enabled to give the following copious description of the last named, from the able pen of Prof. Halsted, of Harvard University. In this chapter our farmer readers will see the origin of wheat rust, smut, potato rot, mildew of grapes, and many other injurious depredations, to which their crops and fruits are subjected by the ravenous appetites of fungi:

Fungi.—"Fungi make up a group so diversified in characteristics that it is almost impossible to give any description of them as a whole. Suffice it to say, they are all parasites, deriving their nourishment directly from the organic substance upon which they feed, having no green leaves in which crude material can be transformed and fitted for the growth of

the plant. They are all thieves, then, either stealing their sustenance from the dead, or robbing the living tissue of all its vital fluid.

"Their range of growth is limited only by the boundaries of other forms of life. The housewife, to her great dismay, finds upon the top of her can of fruit a portion that is white and worthless; a plant has found its proper element, and has been feeding upon her dainties. Your wine may have leaked from your cask to the cellar floor, and when you go to draw a draught, a carpet of the finest velvet has grown for your feet. Yeast is employed to make our bread light and wholesome; and myraids of little plants do the work and do it willingly. Fungi flourish upon our walls, find their way through our books, and pick to pieces the frame-work of the stoutest ships. The animal kingdom is not beyond their reach, and many of its members fall victims to an overpowering vegetation; while it is a well-established fact that many of the most fatal epidemics are the result of their inroads upon the human family. Without further generalization, which is almost worthless in such a group as this, let us pass at once to the consideration of some of its individuals.

"In the mushroom, *Agaricus campestris*, perhaps as well known as toadstool, we have a species of fungus with which every one is familiar. It is the famous *Champignon* of the French, the *Patiola* of the Italians, and was known to the ancients by upwards of a score of synonyms; growing almost everywhere, from the chilling atmosphere of Lapland to the hot climate of the tropics; from the Japan islands on the east, to California on the west. Though it is by no means confined to old pastures, with us it is to be found there in the greatest abundance, and especially after a warm shower in the evening. The rapidity of its growth is proverbial. If we go out in the morning we may see them in clusters exhibiting all gradations, from the young "buttons," resembling eggs in size and color, to those of middle and old age, consisting of a stalk somewhat larger than a man's middle finger, bearing at the top a broad, umbrella-like expansion, which is called the *pileus*. When young, the outer edge of the pileus is united with the stalk, but as it approaches maturity, it breaks away, leaving the *ring* to mark its former place of attachment. If a full grown mushroom is taken, and the under surface examined, it will be found to consist of a multitude of radiating gills of a beautiful pinkish color. It is on the surface of these gills that the reproductive bodies are borne—bodies which, though different in structure, perform for this plant the same office the acorn does for the

oak; but instead of being called *seeds*, they have, in this and all other species of fungi, received the name of *spores*. At the base of the stalk, hidden from sight, is to be found a mass of fine threads, which make up the true vegetative portion of the fungus, and is called the *mycelium*—a term applied to this part of all species of fungi. In France, where the satisfaction of the palate is a matter of no secondary consideration, the mushroom has received the greatest care, and been quite extensively grown. In this peculiar market gardening, caves are often put to valuable use; and old deserted mines have been appropriated for the winter culture of the champignon. The growth and consumption of the mushroom in the United States is rapidly increasing. In Italy this species of fungus is always rejected in the markets as being poisonous, while its place is filled with another upon which the French look with distrust.

Poisonous Mushrooms.—"The fact that some species of toadstools are poisonous, is as evident as that others possess real worth as articles of diet, bearing, as it does, the testimony of many who have ignorantly eaten of the former, supposing them to be edible. Among the illustrious who have perished in this manner, we find the names of the Emperor Jovian, Pope Clement VII, and the Emperor Charles VI. The dread of being poisoned, mixed with no small amount of superstition, together with the difficulty of distinguishing the good from the bad, have all combined to prevent the accordance of justice to this family of plants.

"Any one who presumes to give instructions concerning fungi is expected to lay down certain infallible rules for distinguishing the edible from the poisonous, so that in the future no serious inconvenience or loss of life may arise from their injudicious consumption. Up to the present time this has never been done, and it would not become me to attempt it here. There are certain *general* rules which may be given, but they all have their exceptions, both in including poisonous species and in excluding those which experience has shown to be delicious.

"Those which are bright colored, as red, blue, or green, are to be looked upon with suspicion. Those which change color when bruised, cut, or broken, are usually unfit for food. A milky juice is a bad sign. Those with a moist, waxy surface, are to be avoided. A disagreeable odor while still fresh is a *strong* indication of their not being edible. But, as has been stated, these rules are not infallible; therefore, a last safeguard must be laid down, as follows: *never eat a fungus about which there is any doubt*. The best and shortest method for those who wish to

make use of these plants as articles of diet is to become acquainted with the distinct characteristics of a few of the most common edible species, and use no others.

Edible Mushrooms.—"One of the leading fungi recognized as valuable for food is the morel (*Morchella esculenta*). It has a short, thick stem, terminating in a large ovoid top, very irregular on the exterior, owing to the many compressed folds of which it is composed, thus forming a surface of numerous indented polygons. They are found to some extent in most countries; but those in commerce come almost entirely from the States of Germany. They show a peculiar preference for those portions of woodland, on sandy soil, over which fires have passed. This fact became so evident to the peasants who gathered them that, in order to increase the range of growth, they set fire to the forests to an alarming extent, and rigid laws were enacted to prevent such damage. The morel is extensively used as a flavoring for sauces and soups, but chiefly in the manufacture of one of the finest qualities of catsup.

"The most highly prized of all edible fungi are truffles, of which there are several species, the most common one being *Tuber aestivum*. They are roundish in outline, of the size of a black walnut, having the surface black and much wrinkled, as if by pressure. The interior is quite solid, of a brownish color, and exhaling when cut a very agreeable odor. Their habit of growth is peculiar, as they are subterranean during their whole life, being buried beneath the soil to the depth of several inches. The condition most favorable for the growth of truffles is a soil of a calcareous nature, permeated by the roots of the oak; and the method pursued in France, the only country where the culture has proved successful, is to select the required quality of soil and sow it with acorns. When the saplings have attained a few years' growth the truffles begin to grow. Owing to the subterranean habit of the truffle, the difficulty of finding them, when growing in the wild state, is great, and to this end several processes are in vogue, one of which is quite effectual, and at the same time unique. Dogs and pigs are very fond of these delicate bits of vegetable growth, and, being endowed with a sense of smell far superior to that possessed by man, are enabled to seek out the truffles in their hiding places. When the dog or pig, as the case may be, has found the locality of the plants, he is repaid by a more available, though less palatable, morsel from the truffle-hunter's hand.

"Besides those already mentioned, there are many other species of fungi which have won a general acceptance into the list of those that are fit for food.

Intoxicating Mushrooms.—"Among the poisonous toadstools the *Amanita muscaria* holds a leading place, receiving its specific name from the fact that it is sometimes steeped and the solution used in the destruction of the house fly. The pileus is raised on a long stalk, and often attains the diameter of four to six inches, having its upper surface studded with large white protuberances, making the plant, if richness of color and beauty of outline are considered, better fitted for the throne of a fairy than the stool of an ugly toad. Though so tempting in its beauty, its poisonous effects have become well understood through the sad experience of many who have eaten freely of its tender tissue, to suffer the severest pain, sometimes only relieved by death. A variety of this species grows to some extent in Northern Asia, and especially in Kamtchatka, where it is highly prized by the natives for its exhilarating effects, possessing, as it does, the power of producing a peculiar intoxication. The fungus is gathered and dried with great care; and when a state of inebriation is desired, a small piece is swallowed, and in the course of one or two hours the drunkard is in his glory. This fungus has a peculiar effect over muscular exertion. In his 'Vegetable Kingdom,' Dr. Lindley tells us that a talkative person, under its influence, cannot keep silence or secrets; one fond of music is constantly singing, while he who wishes to step over a straw takes a stride sufficient to clear the trunk of a tree.

Ill-flavored Mushrooms.—"With us the *Phallus impudicus* is the most disagreeable species, and commonly bears the not over-classic name of stinkhorn. It has a stalk five to eight inches in length, bearing at the top a small cap, which, when young, is covered with a green slime. This soon liquefies, and dropping off, covers the ground with an offensive mass, to be eagerly sought for and devoured by carrion insects. The top, when thus relieved of its green outer covering, exhibits a honey-combed surface, and exhales the most disgusting of odors. Many stories are told of the encounters botanists and others have had with this peculiar plant. A case is related of an enthusiastic botanist, who, while on a tour, found some of these plants of unusual size, and wishing to preserve them, placed them in his box; returning home by rail they caused such discomfort to the inmates of the car that every occupant left it with amazement and disgust as soon as possible.

Destructive Fungi.—"Let us now turn our attention to some of those smaller members of this assemblage of plants, which more truly deserve the name of *Destructive Fungi*, and therefore fall more particularly within the province of this lecture.

“The bread, cheese, and cake moulds, though belonging more strictly to household economy, are not without their influence upon the fruits of the horticulturist, and for this reason warrant a passing mention here. They only grow upon organic matter after life has become extinct, but in their growth they rapidly hasten decay, and in this way often do serious damage to fruits and vegetables. An explanation of the cake mould, *Eurotium Aspergillus glaucus*, will answer for them all, though among these little plants great differences are to be observed. The general appearance of this little blue intruder is so familiar to you that a description of it, as seen by the naked eye, is unnecessary. Under the microscope, the little specks resolve themselves into small heads of radiating cells. These cells are formed one upon another from the filaments, and are spores, but of that kind known as conidial or asexual spores. On other *mycelial* threads, at the base of the stalks bearing these conidial spores, the true sexual spores are produced in something like the following manner. Certain filaments first begin to coil up into a close spiral, after which another thread grows up and touches the tip of this coiled filament, and fertilization takes place, a process essentially the same as the pollenization of the ovule in flowering plants, though differing in method and results. After this fertilization, sacs or cells arise from the coil, in which spores are formed, and the whole coil and sacs of spores become surrounded by a covering of cells. On account of the sexual spores being borne in these sacs or *asci*, this fungus comes among the *Ascomycetes*, one of the highest groups of fungi.

“We come now to speak of species of fungi which flourish on living tissues, and on these only, including, therefore, the most destructive members of the group.

Wheat Rust.—“*Puccinia Graminis*, one of the most widely distributed and generally known, is one of the many species of that destructive agency which is often vaguely spoken of as rust. All agriculturists who have made the raising of grain their leading employment, will at once turn in thought to the time when their whole field of growing wheat or oats, the pride of their vocation, was turned, as by the stroke of some unseen demon, into a yellow, premature old age.

“The different stages in the growth of this plant are quite distinct and peculiar, and though somewhat complicated, it would not be justice to the plant or to science to omit the history of the forms through which the rust plant passes from the perfect state to the perfect state again.

“The transformations in the life of a butterfly are so evident that the merest schoolboy may observe the truth for himself; but with the rust

plants the objects are so very small that the changes can only be seen by the keen eyes of a skilled observer, with the best powers of the microscope. Beginning with the spores of the mature rust plant, as seen in the black stains on the old stubble of any grain field, it will be found, when the warm and moist days of spring come, that these spores germinate, producing in a few days a short stem, bearing a crop of other spores of very much smaller size. To avoid confusion we will call these by their scientific name—*sporidia*, while the parent spores are styled *teleutospores*. The sporidia have never been known to grow upon the grass or grain; but when they find their way to the leaves of a barberry bush they soon begin to germinate, the filaments enter the tissue of the leaves, and in the course of a few days make themselves manifest on the under surface of the leaves, in what are known as ‘cluster cups.’ The interior of these pretty little cups is closely packed with spores of a still different kind, which are called the *æcidium* spores. These in turn will not grow upon the barberry, but when they fall upon a blade or stalk of grain, they soon germinate and produce the yellow, rusty covering so often seen, caused by a multitude of another form of spores, called *uredo* spores, clustered upon the surface. In this, the true rust state, the fungus first consists of minute filaments, which run in all directions through the tissue of the grain plant, stealing its nourishment as they go, and is noticeable to the naked eye only when these threads break through the epidermis and bear the yellow or orange *uredo* spores. The rapid and destructive development of this fungus depends much upon the weather. Should there be a series of warm showers, or a muggy atmosphere, just at the time the grain plant begins to form its grain, the growth of the rust plant is especially favored. It absorbs rapidly the food which is on its way to the seeds, and uses it up in producing a vast number of spores upon the surface of the leaves and stalks, at the expense of an empty head of husks at the top. Later in the season, from the *uredo* state the final perfect *teleutospores* are produced, thus completing the circuit of life in this little rust plant. Long before rust was discovered to be a plant, farmers had noticed that there was a close relation between it and the barberry; and at present the latter is being rapidly destroyed, with good results, though it can scarcely be expected that the rust plant will thereby become extinct, as probably the *æcidium* state grows on other plants than the barberry, though not as yet discovered elsewhere.

“This plant is an excellent illustration of polymorphism, so common among fungi, and it also answers well to show the vast number of

spores these microscopic plants produce. The teleutospore usually bears from five to ten sporidia; and allowing only one of these to find the barberry leaf, there may be from one to fifty clusters as a result. In this case suppose only one, and a very low estimate for its contents would be 250,000 æcidium spores; and if only one of these in a thousand finds a place on the grain stalk, and each brings forth its 250,000 fold, there would be, under such circumstances, 62,500,000 from the single one from which we started. Taking the same teleutospore, and supposing every spore in all the stages found its place to fill it, the result would be 1,562,500,000,000,000,000 (one quintillion, five hundred and sixty-two quadrillions, five hundred trillions) spores, which may be looked upon as its descendants for the season. Or giving each inhabitant of the globe his equal share of these reproductive bodies, he would have nearly as many as there are individuals in the whole human race. This may seem like a very large story about a very small matter; but it is not the only wonderful truth the microscope has revealed.

“It is much easier to tell in what rust consists than how to avoid it. Knowing the nature of the plant, and that in one of its stages it grows upon the barberry, the cutting away of all barberry bushes may do much to check this unwelcome pest, if not to improve the landscape and the general appearance of the farmers’ boundary lines. As to the best time to sow a crop to avoid the rust, little information can be given. Sow when you would expect the best returns were there no such thing as rust. Many trials have been made of soaking seeds in various chemical solutions before sowing; but, from the nature of the parasite, little good is to be hoped for from such a practice. Until the weather is under man’s control, we cannot hope to eliminate the conditions for the rapid development of rust, causing, as it will, a partial or entire failure of the grain crop.

Corn Smut.—“The *Ustilago maydis*, generally known as corn smut, is another of these microscopic plants which often grows in fields of maize. Though less prevalent than the rust, it is, like that, a sworn enemy of the agriculturist. Sometimes it makes its appearance only at one or two of the joints, causing a bending, so that the stalk frequently reclines on the ground. Again, it seems to take possession of the whole plant while it is still quite young; and, as a result, there is only a dwarfed and rotten mass, but a few inches above the surface of the soil. The greatest damage is done when the thief takes possession of the kernels while they are still quite young, transforming their tissue into its own long

mycelium threads, which at maturity produce, in infinite numbers, the minute blackish spores. Frequently, only a few of the grains are affected, making a striking contrast with those of natural size. It was long supposed that this smut was a diseased state of the corn plant; but there is no longer reason to doubt that it is a small, dirty plant, growing at the expense of one of the most useful members of the vegetable kingdom. Vegetation and reproduction in these plants are reduced to their simple forms, and the space from the time when a spore germinates to the time when spores are again formed may be reduced to weeks, and even days, instead of being months and years as in plants of a higher and more complex organization. The grains of corn that, to the naked eye, appear perfectly free from the smut, may have their tissue interwoven with its mycelium threads; and when the grains thus affected are planted, the fungus is planted with it, and as the corn plant grows, so does the parasite, until the presence of the latter becomes evident in its black, dusty fruitage. This is one of the methods of propagation which is of great importance to the existence of the smut plant. As with the rust, there seems to be no available method of staying its ravages when moist and warm weather comes at just that season of the year best fitted for its rapid development. Still, much could be done to reduce the number of its reproductive bodies, by cutting off and burning the affected portions before the smut plant has ripened its spores. Concerted action is required in a movement like this; and when farmers, as a whole, see that it is for their interest to go through their fields of growing corn, and destroy this pest in its early stages of growth, we can assure them that from that day on they will have more and better corn for their labor.

Rye Smut.—"In all cereals to some extent, but especially in the rye, may frequently be found a fungus which has long been known under the name of ergot (*Claviceps purpurea*). Like the corn smut, this plant attacks the young grain and causes it to assume a very much enlarged form, protruding far beyond the husks, and resembling a cock's spur, whence its common name 'spurred rye.' The whole enlarged mass is made up of hard mycelium, on the surface of which the conidial spores are borne. The fungus may exist in this indurated form for a long time without further development, but when these ergot grains fall upon moist earth, sprouts soon proceed from them which form club-shaped heads at their extremities, in which spores of the second form are produced in little sacs. These different forms were for a long time consid-

ered distinct species; but the hard state, that in which ergot exists as sold in the shops and used in medicine, is only a form which many fungi have the power of taking on when they prepare for a season of repose. Ergot is one of most poisonous of the smaller fungi. In several provinces of France and Germany, epidemics of nervous derangement, resulting in gangrene and frequent loss of limbs and even of life, have been traced to the consumption of this plant in the bread made from rye which was largely spurred, the result of an extremely favorable season for the growth of this pernicious fungus.

Potato Rot.—"It is to be presumed that no one species of plant has caused so much suffering to the human family as *Peronospora investans*, or potato rot, as it is called in common parlance. Those of you old enough to glance back in memory to those fatal years for Irish peasantry, when their almost sole source of sustenance was swept from them by the ravages of the rot, can form an idea of the influence even a microscopic fungus can exert over the comfort and civilization of the race. The potato rot is one of those small microscopic fungi best known to the naked eye by its terrible effects. Its first general appearance was in the year 1845, when it was first seen in the Isle of Wight, and a few weeks after was observed with great wonder and dismay by all growers of the potato throughout Europe. It is a plant which flourishes only in damp weather, and its prevalence depends much on the condition of the atmosphere. The fungus is first recognized by the potato leaves turning brown, owing to the absorbing threads of the 'rot' within the tissue. Soon certain threads come to the surface, pass through the breathing pores, divide into several branches, and bear the conidial spores on the tips. In this condition the leaves look as if covered with a fine frost. The spores thus produced germinate at once, and in this way the disease is rapidly spread to other plants throughout the field. The fungus soon passes down the stem to the growing tubers, and they in turn give up their substance to this parasite, and then become rotten. As the rot does not make its appearance until the hot and moist days of July, the earlier varieties stand a greater chance of escaping it than the later. In all cases where the disease is gradual in its appearance, and the tubers are nearly mature, they should be dug at once. If the fungus has reached the tubers, they will rot to some extent; but when placed in a dry cellar, the rotting is considerably retarded. In raising potatoes, select a well-drained or naturally dry soil; plant early varieties and plant them early. Always plant the soundest and most mature

tubers. Gather the crop as early as possible, and burn all tops at once, thus destroying the spores which might otherwise carry the pest over the winter season. When every condition is the most favorable for its development the rot will take its most violent form, and the crop will fail, as it has so often done in the past.

“The potato rot has long been known to the South American Indians dwelling in the regions of the Andes, showing that this plague is not of recent origin, and also that the land which gave us the wild potato has likewise produced its most destructive parasite, which has followed it across the seas. There is no object in nature concerning which men have given more curious and conflicting theories than the plant in question, and to-day the list is long of those who fail to recognize in it a member of the vegetable kingdom. But when the plant can be cultivated, the spores sown on sound potatoes, and the vegetable watched through its whole existence, culminating in the rot, it is time to believe that it is as much a plant as the one upon which it grows.

Grape Mildew.—“Another species of this same genus, *Peronospora*, is the American grape-vine mildew. The true grape disease, the one which has proved so disastrous at different times to the vines of Europe and Madeira, is caused by another fungus, to which Berkley has given the name of *Oidium Tuckeri*. It is a form of a fungus which has not been recognized in its perfect state, and is supposed to occur to some extent on this side of the waters; but as many species have this conidial form, and some nearly identical with it, and also growing on the grape, there may be some doubt as to our vines ever being attacked by the true grape disease of Europe. The *Peronospora viticola*, the mildew which most interests the grape growers of America, is quite common, appearing on the under surface of the leaves about the first of August, and continuing to flourish until the leaves will nourish it no longer. It can be most easily seen on the smooth leaves of the *Vitis cordifolia*, having the appearance of small, frost-like spots, which rapidly spread and soon cover the whole leaf, frequently extending down the petiole to the stem. This fungus, like the potato rot and other closely-related species, flourishes best in moist, warm weather. Under the microscope, the tissue of the grape leaf is seen to contain an abundance of minute threads, which force their way in all directions between the cells of the leaf, thrusting their suckers into the cells to rob them of their nourishment. When the time for fruiting comes, the threads pass out of the stomata of the leaf and branch in a definite manner, and bear the

asexual spores on their tips, as we have observed in the potato rot. Under the head of the germination of these asexual bodies, Dr. Farlow has performed some interesting experiments. He finds they germinate equally well in the dark as in the light. Those sown in the morning germinate more quickly and abundantly than those sown in the afternoon. It was not possible to keep the spores which were formed in the night until the afternoon, as they generally fell from their attachments in the morning and began to germinate. In all cases the germination took place with surprising regularity. At the expiration of an hour and a quarter the contents of the spores had formed small oval bodies, which, before long, ruptured the cell wall and made their escape from the mother cell. They passed out rather slowly, usually one at a time, and paused for a moment in front of the opening, where they remained as if not quite free one from another. In a short time, each body began to extricate itself from the common mass, moved more and more actively, and finally darted off with great rapidity, a full-fledged zoo-spore, furnished with two cilia. The average number of these rapidly moving spores is from six to eight. Their movement gradually grows slower, and in from fifteen to twenty minutes they come to rest. Soon an outgrowth proceeds from one side and rapidly develops into a new plant. The sexual spores are found in autumn, within the tissue of the shriveled leaves, as spherical, thick-walled bodies. They escape by the breaking up of the dry leaf, or through the decay of the surrounding tissue. The statement is often made that the mildew does not grow on the *Vitis vinifera*. By carefully conducted experiments, Dr. Farlow found it could be made to grow on the leaves of this European species, and with the usual luxuriance.

Plum Blight.—"The black knot, to quote from Dr. Farlow's excellent article on this subject, published in the 'Bulletin of the Bussey Institution,' volume 1, page 440, is 'without doubt the most striking disease of vegetable origin occurring on fruit trees in this country. The disease takes its name from the unsightly, black, wart-like excrescences, with which every one is familiar on plum trees and different kinds of wild and cultivated cherries. It is found in all parts of our country east of the Rocky Mountains, and is so common and destructive that in some districts one seldom sees a plum tree free from the knot. In some parts of New England, particularly in Maine and along the sea-coast, the raising of cherries has also been almost abandoned in consequence of the ravages of the black knot. The disease is peculiar to

America, and has been the bane of fruit-growers from early times; and although much has been written in agricultural papers about its injury to the fruit crop, the subject has been almost entirely neglected by botanists. As a preliminary step it will be well to trace the development of the knot as it occurs on a single species, and for this purpose the choke cherry (*Prunus Virginiana*) may be selected.' The size of the knots varies greatly, being found on the species of *Prunus* under consideration all the way from a few lines to several inches in length, with an average of two inches in circumference. The knot does not usually entirely surround the branch, but, growing from one side, often causes the stem to bend or twist into an irregular shape. In the winter, when the branches are leafless, the knots are much more noticeable, and at this season they are often cracked, broken, worm-eaten, and hollow.

"In the swollen portions of the branch, above and below the knot, sections under the microscope show the vegetative portion of the fungus in the form of minute threads, twisted together and extending from the cambium towards the outer portion of the stem, where they become separated. The fungus first reaches the cambium, either by germination of spores on the surface of the branch, or by mycelium proceeding from a neighboring knot. The part of the cambium free from these bundles of mycelial threads grows in the usual manner; and in an old branch shows one more layer of wood on the sound side than on the diseased side. From this it is to be concluded that the growing layer of tissue of the plum or cherry branch is the place in which the fungus begins its destructive work. In the spring the swollen portion of the branch increases in size, and the mycelium soon reaches and bursts through the bark, so that, by the time the choke cherry is in flower, the knob has reached nearly its full size, though differing from an old one in being still greenish in color and solid or pulpy in consistency.

"With a hand lens one can see small hemispherical protuberances, which are the beginnings of the 'perithicea,' or pits in which the sexual spores are to form. The whole surface of the protuberances is covered with filaments, which are somewhat flexuous and branched. At the terminal joints, or frequently a little to one side, conidial spores are borne. These spores continue to be formed until near the close of summer, when the filaments dry up and only their shriveled remains are to be seen. The knots now assume their black color, the inner pulp being either destroyed by insects or reduced to a powdery mass, with only the hard outer shell which contains the perithicea left in place. About the middle of January the spores in the sacs in the perithicea begin to ripen.

Cherry Blight.—"The knots on the choke cherry, when compared with those on the plum and cultivated varieties of cherry, are seen to be slightly different in general appearance; but when viewed with the microscope, all prove to be identical, the difference noticeable to the naked eye being due to more favorable circumstances for its growth afforded by one species of *Prunus* than another.

"Dr. Schweinitz was the first to describe the fungus causing the black knot, under the name of *Sphaeria morbosa*.

"The black knot is far from being of recent origin, and has furnished a subject about which vastly more has been written than was known. Many, especially the early writers, held it to be of insect origin, while, later, others have looked upon it as a vegetable growth, and still others include in its production both these forms of life. During the last thirty years, the insect theory has been gradually given up by the entomologists, but it still remains for many fruit-growers to accept the knot as being of fungous origin. The proof given by Dr. Farlow is very conclusive on this long disputed point: 'First, the knots do not resemble the galls made by any known insect. Secondly, although insects, or remains of insects, are generally found in old knots, in most cases no insects at all are found in them when young. Thirdly, the insects that have been found by entomologists in the knots are not all of one species, but of several different species, which are also found on trees that are never affected by the knot. On the other hand, we never have the black knot without the *Sphaeria morbosa*, as was admitted by Harris, and the mycelium of that fungus is found in the slightly swollen stem long before anything which could be called a knot has made its appearance. Furthermore, the *Sphaeria morbosa* is not known to occur anywhere except in connection with the knots.'

"With a knowledge of the nature of this contagious disease, the remedy at once suggests itself, namely: to cut off the knots, together with the swollen portions of the branches, whenever and wherever they are found. In autumn, as soon as the leaves fall, the knots can be most easily seen, and all branches bearing them should be cut off and burned at once. Though the sexual spores do not form until late in winter, it was carefully observed that, were the knots left undestroyed, they would ripen after the branch was cut from the tree. The choke cherry, bird cherry, and wild plum furnish means for rapid propagation of the knot, and they should be gladly sacrificed for the good of their more worthy allies. Knowing the cause, nature, and means of propagation of the

black knot, it is for the fruit-growers to profit by their instruction, and use their best endeavors to destroy this pest. It is now peculiar to America, and any means of introducing it into other countries should be carefully avoided.

Carnivorous Fungi.—"In concluding this general and very incomplete account of fungi, perhaps it will not be more than justice to give a notice of some of these parasitic plants which prey upon living animals.

"Who has not seen house-flies in autumn, crawling slowly upon the wall with their bodies covered with a white powder, making them appear as if they had paid a visit to the flour barrel; or, later still, found them fastened in death to the wall or window-pane? The struggle between the animal and vegetable has been won by the latter, which in turn must also perish when the substance of the fly is all destroyed. The tender and valuable silk-worm has long been subject to epidemics, by which large quantities have perished, causing such fluctuations in the price of silk that the trade in this product has frequently been threatened with a panic. The fungus, which is commonly called *muscardine*, begins its growth within the body of the insect, soon to increase in size and burst through the skin, thus producing death.

"One of the most curious of these insect-infesting or carnivorous fungi grows upon or from the head of the larva of a certain species of moth. It is an amusing sight to see the heavily-burdened larva bearing erect upon the front of its body a vegetable growth, often three or four times its own length, the signal of distress as it must be, telling plainly the slow but inevitable approach of death.

"Thus we have seen that the members of this peculiar group of plants, which has received the name of fungi, are all parasites, and from their very nature do not increase the amount of organic matter in the world; but, on the other hand, are powerful reducing agents, seizing upon that which is highly organized, and aiding rapidly in its reduction to a more simple state.

"Though fungi furnish delicious articles of food, it is in the light of their power to hasten decomposition that we see their great importance in the world; aiding in the cycle of life by facilitating decay. Sometimes they encroach upon our fields of growing grains and fruits, and do us serious damage; but even here the moralist would say there is a lesson of appreciation and care for our crops, which only the school of sad experience is able to teach."

From the lecture of Prof. Halsted much that is new to our farmers will no doubt attract their attention, all of which deserves their most serious consideration. A good magnifying glass or a microscope will, if used skillfully, show all that has been said about the mushrooms or fungi to be correct, and will further aid the farmer in comprehending many other things which now appear mysterious in the complex system of plant life. The animal parasites are as numerous as those belonging to the vegetable kingdom, and are equally as destructive as these are to vegetation. The proper place to treat of these, however, is under the head of entomology. Most farmers are acquainted with these, under the names of Hessian flies, midge, army worms, caterpillars, grasshoppers, grubs, boll worms, tobacco worms, curculio, &c., &c., &c., in endless varieties. The United States Government has a scientific commission especially appointed to study the habits, mode of life, nativity, and method of getting rid of these various pests, which it is estimated eat up or destroy one fourth of the entire product of that portion of the world's labor employed in the industry of agriculture. Late discoveries by the scientists, through means of the compound lens, are bringing to light the fact that a large number of diseases common to man and animals, such as cholera, croup, typhoid fever, and most diseases of an acute inflammatory character, have their origin in the superabundance of animal parasites, which are mysteriously conveyed to the blood, flesh, or nerves of the physical system. But this relates to the medical profession, and will no doubt, after awhile, be duly examined and understood by their learned professors.

SLACK-WATER NAVIGATION.

No State in the Union has greater facilities than Kentucky, for having her smaller rivers made navigable for steamboats, by a system of dams and locks known as the slack-water system. This class of improvements can be made, at a comparatively small cost, on the following streams: Big Sandy, Tug, and West Forks, Licking river, Red river, Kentucky river and her Three Forks, Cumberland, and South Fork of

Cumberland above the falls, Green and Barren rivers, Pond river, Rough creek, Salt river, Little river, and Tradewater.

The great advantages which would accrue from having these streams, or even a part of them, navigable, so as to give an outlet for coal, iron, timber, and agricultural products, would be incalculable. I will not here attempt to give, in detail, the peculiar claims of each stream for special consideration, but will give an extract from a report made to the Kentucky Legislature by Prof. Shaler, of the Geological Survey, at its last session, regarding the improvement of the Kentucky river and its Three Forks. What is here said respecting that part of the State to be benefited by the improvement of the Kentucky, with proper modification, is equally applicable to the other streams and sections of the State:

The Professor says: "A glance at the general map of the State will show that the eastern coal and iron district of Kentucky, which includes over two thirds of its mineral area, is practically deprived of all means of transportation. By the widening of their beds, consequent on the destruction of timber along their banks and over their drainage basins, the Big Sandy, the Licking, the Kentucky, and the Cumberland, which penetrate its boundaries, and have afforded the way for most of the transportation that has been had from this area, have become less and less available as outlets for its coal, iron, and other products. Two railways have touched its borders, and a third has penetrated over thirty miles into its field; but the map will show better than words how little of the region has been developed in this way. Imperfect as are the results of these railway routes, they seem to show how much can be done for this region by transportation facilities. The counties of Greenup, Carter, and Boyd have been lifted by them out of their poverty and set on the road to great wealth. The effect of these new roads has only begun to be manifested; but if we could only carry the development of the whole region of Eastern Kentucky to the same relative point of advance, the addition to our taxable wealth would be counted by hundreds of millions, and the population of the State would gain an addition of at least a million of souls.

"In considering the future of our mineral industries, we must not lose sight of the fact that we are placed in the great river valley of the Ohio, where there are many sources of supply whence may come the materials which we can furnish to the arts of our time. All the States bordering the waters of the Ohio system, excepting New York and Mississippi,

may compete in the production of iron and coal of much the same qualities as those found within our own borders. I am convinced that in the character of these ores, and in the circumstances of position, our Commonwealth has some advantages over all its competitors; but to assure these advantages we must make a total change in our policy. We must abandon the policy of neglect hitherto pursued in our dealing with questions of transportation, and set to work making ways to our wealth. Nature has done much for us in the roads to our mines, as she has in laying the wealth beneath the ground. The work is more than half done, and the capital and energy required to bring it to completion is but a trifle in comparison with the advantages which would come from the possession of these ways.

“As regards the character of the beds of coal, iron, salt, and other materials, by far the greatest part of the facts are doubtless to be learned from the more complete exploration of the country. There is enough known, however, to make it clear that both in variety of products, and in the facilities for obtaining them, this region can successfully compete with any other within the drainage basin of the Ohio river. The appended special descriptions of the mineral resources of the upper Kentucky will give a part of the details already accumulated by the incomplete work of the Survey. It will be seen from those records that there is a mineral field of at least three thousand square miles which can be made accessible by this form of improvement. Of this, about two thousand five hundred will furnish coals of varied qualities. A large part of this coal is about as good as Pittsburg for house and steam uses. The main sub-conglomerate coal, the equivalent of the Pine Hill coal at Livingston, is a superior gas coal, giving, as found at Pine Hill, within ten per cent. of the amount of gas found in the best Pittsburg coal, as determined by the superintendent of the gas-works at Crab Orchard Springs. Though the lot of coal from which the determination was made was not as well selected as it might have been, it is quite probable, from the analyses and from the experiments made with these sub-conglomerate coals in Tennessee, that some of them will serve for the smelting of iron ores in their raw or uncoked state. By this means, or by coking, there can be no doubt that we will find an abundance of cheap stone-coal fuel for furnaces in this district. The cannel coal that can be furnished by this district is practically inexhaustible, and of excellent quality. Besides its great value for home use, there is a large and growing demand for this material to enrich coal-gas. The consid-

erably higher price of this coal enables it to be carried over a wider field, and the States of Ohio, Indiana, and Illinois would, throughout their extent, be within the probable range of these coals via the Kentucky river.

“Associated with these coals we find an extensive series of fire-clays, some of them likely to prove of considerable value, though their precise importance is not easy to determine at the present time. The conjunction of good clays, cheap fuel, and water transportation, ought to open the whole Mississippi river system to these sources of production. The demand for the various forms of bricks, tiles, and retorts made from fire-clay, is already to be counted in this country by the millions of dollars annually, and each advance in our population or industries will greatly widen the market.

“The iron ores of this district have been but little developed, and such ores are generally so far hidden beneath the surface that much and continued research is necessary in order to show their real character and extent. Even in well-known iron districts, where workings have been carried on for half a century or more, it is not uncommon to fall upon new and valuable beds that had been previously overlooked. In an almost unbroken wilderness, where the iron industry has been limited to a single furnace, it is not to be expected that we shall know more than a small part of its real resources in the way of iron ores. Enough is known, however, to make it quite certain that there exists here the basis of a very extensive iron-making industry. The ores which are found on the top of the sub-carboniferous limestone, and which have furnished all the ore used in the famous Red River Furnace, has been found to cover over a large area both on the north and south slopes of the Kentucky river. All the sub-carboniferous limestone which has its top above the level of the drainage may reasonably be expected to contain the ore; and wherever it has been seen by the parties of the Survey, it has been of workable thickness, and of the same excellent quality that has given value to the beds on Red river. It is probably much within the truth to estimate the area of this ore above drainage, on either side of the river, at two hundred square miles—of which relatively a large amount would be accessible by benching, on account of the much intersected character of the surface.

“The valuable deposits of the Preston Banks are within a short range of transportation of the Kentucky river. Any one of the several projected railways from Mount Sterling will be apt to bring these ores

within reach of the Kentucky river. When this is the case, there will be a chance to mingle the ore from these beds with the sub-carboniferous limestone ore of the Kentucky river. We as yet know nothing of the ores above the last named ore, and they are probably less rich than in the basin of the Little Sandy or in Western Kentucky. But, as before remarked, the limestone ore is of itself extensive enough to become the basis of a great industry.

"The salt belt of Eastern Kentucky includes all the country east of the line where the black shale of the Devonian series falls below the drainage of the country. Practically it may be said that all the land which has coal beds near the drainage level comes within the salt belt. At present salt is made at a profit at only two points—near Manchester, on Goose creek, a branch of the South Fork, and at mouth of Troublesome creek, on the North Fork. It seems pretty certain, however, that salt water can be found over nearly all the eastern coal field. It will naturally be found of varied strength at different points; but it is my conviction that the observed variety of strength is rather to be attributed to the imperfect tubing of the wells, which does not effectually exclude the water of higher levels, than that which carries the salt. I have little doubt that the use of proper precautions would give a good supply of salt water at almost any point within this district.

"Along the Kentucky cliffs there are several points where Kentucky marble, a dolomitic limestone of excellent and varied character, can be had under circumstances very favorable for quarrying. This well known stone, one variety of which is seen in the Clay monument at Lexington, is admirably fitted to stand the rigors of our climate. It is easily worked, and of great strength.

"Further up, near the mouth of Red river, we come upon the stone known as the Buena Vista sandstone, which has been for many years very extensively quarried along the Ohio river in the neighborhood of Lewis county. It is now shipped to Chicago, New York, and even to Boston. Beds of this stone can be quarried to great advantage at many points on the main stream and its tributaries, and we may reasonably expect a good market for it in the Ohio river cities. The excellent stone used in the court-house at Paris, Bourbon county, can doubtless also be found at several points near the Kentucky river, and will serve to add to the variety of building materials.

"The timber supply is extensive, and remarkable for the great variety of species which seem to find here their best conditions. There is a

considerable quantity of yellow pine, of a size fitting it for use in the arts, and some white pine of rather inferior quality; some hemlock, and a good deal of cedar timber may be had in the district. The main export will be of the non-evergreen species of our forest trees—oaks, hickories, poplars, &c. The drainage of the Kentucky above Frankfort contains probably not far from three thousand square miles of forest land, which is continually yielding successive crops of our most valuable woods.

“The investigations of the Survey in the Little Sandy district show conclusively that the soil of Eastern Kentucky readily reproduces its forest vegetation of the same kind as that which has been cut away; so that there is no doubt that the supply of timber from the lands unfit for agriculture may be continued for an indefinite time.

“Some exportation of these woods to Europe has already begun. Last year about five hundred logs of walnut were shipped from Frankfort by car to New York and thence to Germany; and I am informed by J. G. Dudley & Bro. that there will be several times as much sent this year by the same road. Although this method of shipment entails a far greater cost than would be incurred in exporting by the water route to New Orleans, it will doubtless be found profitable at the present rate of prices, which will pretty certainly not be lessened in the future. The whole of the upper part of this valley will be found peculiarly fitted for the growth of this species of timber, without any planting whatever, and with only reasonable care of those parts of our forests in this valley which do not occupy land fit for agriculture, it can readily yield ten thousand walnut trees to the woodman’s axe each year for centuries to come. After taking out the land fit for agriculture, there will remain in this valley not far from ten thousand square miles, which should be devoted to timber-growing, in order to furnish timber for the mines and for export.

“The agricultural value of the land to the eastward of the blue-grass belt is greatly underrated. The popular prejudice has stamped it as mountainous and uncultivable. It is true that a great deal of it is too rugged for profitable culture; but there is a great deal of tillable land exceedingly well suited for many crops. Chemical analysis, as well as the surer test of actual experiment, goes to show that a very large part of it is admirably well fitted for the growth of tobacco of a very fine quality. There is no doubt that when transportation is furnished this will become an important article of export.”

It is a question how these improvements should be made, whether by the State or by private corporate companies. On these points I will not express any view, leaving the subject for the due consideration of the parties most interested. The State has already, at present, over one million of dollars invested in the improvement of the Kentucky, Green, and Barren rivers, which needs the immediate and definite attention of a promptly acting Legislature, in order to prevent serious loss to the State, and the citizens of the different counties along the line of these streams.

Whatever policy is adopted should be positive, promptly executed, and fearlessly proclaimed, that the people along the streams may know upon what to depend. Several writers and speakers have advocated the plan of working the convicts of the Penitentiary on these rivers, and also on other works of general public utility, dividing the labor equitably in the different sections of the State. This and other plans will no doubt receive the due consideration of the General Assembly of Kentucky and the people of the State. In the great future mankind will need all the ores, stone-coal, timber, and soil productions of the State, when no doubt means of cheap transportation will be furnished through systems of railroad and water conveyance. When this will take place we cannot judge exactly; but the gradual development of our resources will hasten the period much faster than it is usually thought, even by the most sanguine. Time only is needed, which comes of its own accord, and all things will yield to its demands.

NARROW-GAUGE RAILWAYS.

Of late years public sentiment has undergone a considerable change in regard to the railroad systems of the country. When the present railroad systems of Europe and America were inaugurated, in the second quarter of this century, the engineers settled upon what is known as the broad-gauge as the most economic and safest method of road-building; and all the main trunks and branches on the continent, in England, and in the United States, were constructed on this plan. Mr. Stephenson, an Englishman, about 30 years ago, began to agitate the question of lessening the gauge from seven feet to four feet eight and a

half inches, and finally succeeded, with the aid of years of disastrous experiences, to prove that the narrower was better and more economical than the wider gauge. Mr. E. C. Spooner, the engineer on a short road in North Wales, reduced the gauge to two feet in 1863, and found that it worked well; this brought up the question whether the narrow-gauge system could not be applied to all sections of the country. Since 1863, the advocates of this system have fully demonstrated, for all useful and economic purposes, that a railroad of three feet gauge is better than one of four feet eight and a half inches, and that they cost from 40 to 60 per cent. less in construction, and are much easier and cheaper to run. Besides, they lessen the draft made on the woodlands for timber to make ties nearly half, thereby saving to the forests of the country immense numbers of trees each year.

Of these three feet narrow-gauge roads, there are now completely built, and in running order, several in Europe and England, and over 3,000 miles of the same in the United States, besides over fifty new roads of the same kind now in process of construction.

The present railroads in Kentucky are of the four feet eight and a half inches gauge, except the Louisville, Harrod's Creek, and Westport road, and the Mount Sterling railroad, running from Mount Sterling 18 miles to the coal banks, which are three feet gauge.

The present low price of labor and iron ought to be an inducement to our people to have more of these narrow-gauge railroads built, in order to bring out from inaccessible parts of the country the coal and mineral wealth, as well as the agricultural products, and also accommodate the local travel which would become greatly increased by the impetus given to the business of the country. From eight to ten thousand dollars per mile, in many parts of the State, would be sufficient capital to build this class of roads, with capacity to do all the freight and passenger business for the next fifty years. The saving to the people in the preservation of teams and wagons, and the extra value of their crops, would pay for the building and all accumulated interest within less than seven years, to say nothing of the development of the resources, and the increased population, that always follow such enterprises.

In those counties having no turnpikes, it would be cheaper to build railroads of this class, all things considered, than the present rock-made pikes. Good turnpikes cost from three to five thousand dollars per mile, while a narrow-gauge railroad costs but little if any over double those figures. Experience of the builders of this cheap class of roads

is, that they will do all the business of the country at half the expense of those of the wide-gauge, and therefore pay good dividends, while the latter, on account of their great cost in running expense, generally pass into the hands of the receiver in bankruptcy.

What our State needs is cheap transportation and quick transit for the products of the soil and for passengers to the commercial centres; and we trust this want will be greatly lessened within the next decade, by the construction of several of these roads as arteries of trade, managed for the development of the country and good of the people, and not as monopolies and for the profit of speculators.

HORTICULTURE.

Horticulture is generally made to include not only the cultivation of flowers and vegetables, but also every kind of fruit. Hence garden farming, wine-making, nursery business, and every class of fruit culture, may be considered practical branches of this science. These form the flowering branches of the agricultural tree. In ancient times, only the few of the most enlightened had clear perceptions of the beautiful, for the reason that education was quite limited. The love of beauty and sublimity in nature is an inherent principle of the human mind, but like intuitive qualities, it requires fostering, or it sleeps in its native rudeness. The cultivated brains of the artist, poet, and philosopher catch glimpses of elysian fields, arcadian realms, and flowery meads, where sport the beautiful youths or the joyous herds of animated beings. As civilization and education advanced from the ruder ages in the world's history, so did agriculture and horticulture. The Persians copied from the Hindoos, the Greeks from the Persians, and the Romans from the Athenians. The Egyptian kings and Hebrew judges delighted in rural affairs. Laertes gloried in pruning his vines, and Hesiod, as a husbandman, composed his verses at the foot of Helicon. Varo the councilman, Cincinnatus the soldier, Cato the statesman, Pliny the patrician historian, Virgil the poet, Horace the satirist, Cicero the orator, and Augustus the magnificent emperor, were all passionately fond of rural

scenes, and delighted in agricultural and horticultural employments. They extolled the beauty of vineyards, olive orchards, and flower gardens. Cultivating the soil, and attention to garden vegetables, plants, flowers, and orchards, were considered by them no disgrace. Cicero wrote that "agriculture is the most useful of all employments, and nearest the purely philosophical kind;" Descartes joined the culture of flowers with the study of astronomy; Lord Bacon regarded a vase of flowers, of the most exquisite perfumes, almost as a necessity on his writing-table, when he would have his great mind enjoy the pure thoughts of his sublime philosophy; and Voltaire reckoned the gift of flowers as one of the richest legacies given by nature to man.

Horticulture, as applied to ornamental and landscape gardening, has been but little attended to in our State; yet in some localities beautiful lawns, well-pruned groves, and graceful shrubbery show the abode of refinement and elegance, which betokens the highest morality and most elaborate and polished civilization. But in laying out and planting public gardens we are far behind the older countries of Europe, and even some of the States of this Union, where a more rigorous climate is a serious drawback to horticultural excellence. In Great Britain, France, Germany, and Switzerland, special care is taken to adorn the railroad depots and public squares with green plats, shrubs, and flowers. The Kew Gardens of London, the Botanic of Dublin, the *Jardin de Plants* of Paris, and many others, are the outgrowth of public sentiment and interest of those countries in horticulture. Who can estimate the influence of these gardens upon the thousands who visit them yearly? They are so complete in system, classification, and detail that one can here examine, during a single visit, the vegetable representatives from nearly all parts of the globe. These gardens on certain days are open to all classes, the poor as well as the rich, who can admire their beauty and enjoy their delights.* In many cities and towns, as well as in the adjacent country, besides the public gardens, are countless numbers of minor ones, scattered almost everywhere. Most of these are places of taste and neatness, where are to be found every variety of cultivated flowers and fruit trees. The continental love of horticulture also expresses itself into notice in the grand parks, such as the Dublin, the Hyde of London, the Bois de Bologne of Paris, the Pincian of Rome, and hundreds of others scattered over Europe to give pleasure to the mind and elevate the sentiments of the people.

With us these refining branches of horticulture could be greatly extended, if our farmers everywhere would look more to beautifying

and adorning the homestead, and add to its comforts and pleasures. Every homestead in the country, to become complete, should have a kitchen-garden, orchard, vineyard, apartment for small fruits, and another for shrubbery and flowers. Such a home refines the taste of our sons and our daughters, and gives delight and satisfaction to our wives.

Our towns and cities should imitate their Continental sisters, and have public lawns, parks, and gardens, and our private village and town citizens should dedicate some thing in this way to adorn their homesteads, and elevate the finer instincts of our nature, and improve the talents of future generations for refinement and beauty.

Vegetable gardening, above any portion of farm work, gives profit that is never lost by the rises or falls of prices, for it supplies the very things, in their best condition, most needed as food by the family. I will give a brief list of such vegetables as seem specially suited to the climate and soil of our State, together with such points of interest regarding their cultivation as may be advantageous to persons not skilled in gardening.

The potato is by far the most valuable of our vegetable garden products, and is more universally cultivated and better known than any other single article of food. It prefers rich sandy loam, but will grow in this climate upon any soil, upon which a liberal supply of barnyard manure, straw, and ashes are used. Gypsum and the superphosphates are also good fertilizers for this tuber, and will frequently cause an increase in the yield which is astonishing. The early planting in March or April usually does best. The ground should be well and deeply plowed before planting, and then cleanly cultivated. The product varies, according to the land, cultivation, and fertilizers used, from 20 to 400 bushels per acre. The ravages of the striped and the Colorado potato bugs can be entirely prevented by using Paris green, say a large table-spoonful of Paris green in a pail of water, which is sprinkled over the plants; or a better method is to use a mixture of two pounds of Paris green well manipulated with 100 pounds of gypsum, to be sprinkled over the potato-tops. This will more than pay for the expense and labor by the advantage of the gypsum as a fertilizer.

Sweet potatoes yield about the same as the Irish, but require more care in starting the sprouts and getting a stand. The hot-beds should be made in February or March, and be highly manured; from these the plants are drawn and reset like cabbages. The sweet potato must be well guarded from the winter freezes.

Onions, next to potatoes, is the most lucrative of garden vegetables. For early planting, the potato or multiplying onion is the best, both for productiveness and quality. The silver-skin and Spanish red are excellent varieties, but the large red and yellow Connecticut onions are the most prolific, and give the best profit for a field or market crop. Under very high cultivation, in portions of New England, over 800 bushels have been gathered from one acre of ground. The seed should be sown as early as possible in the spring, in drills 16 to 18 inches apart. Fall planting of some varieties answer better in this climate than spring planting.

Turnips.—This has been called the "sheet anchor of British husbandry," on account of its great use in feeding cattle and sheep. It should be more extensively used in this country, and, if properly sown in July or August, will never fail of a good crop. The best varieties are the Flat Dutch, the Winter, and Ruta Baga. An old cow-pen of rich hard-tramped old land well broke, or new ground, produce the best turnips.

Squashes, Cimblings, and Pumpkins.—These are all of the vine or melon variety of vegetables, and are very easily grown if the land is rich and the plants protected from the striped bugs until they get a start. There are many varieties of each, all of which flourish when planted alone or when placed carelessly in the corn-field.

Melons.—The muskmelon, cantaloupe, and water-melon are easily raised in hills well manured with chemical fertilizers or well-rotted stable litter. They should be planted in April, and well attended to until the vines get a good start. Every neighborhood has its favorite variety of each, which are too well known to require a description. The cantaloupe is in great favor in South Carolina, Georgia, and Florida, and can be found on every well-to-do farmer's table at breakfast, dinner, and supper, from May till October, and is reckoned more healthy than any other article that can be eaten, except rice.

Cucumbers are easily raised, in the same way as other similar vine-growing vegetables. The striped bug can be driven off by sprinkling on the small plants carboic acid diluted, or diluted coal oil. Nothing pays better than this crop produced in quantities for pickles.

Cabbage.—This is the Dutchman's delight, whether used as greens, boiled cabbage, or krout. No plant is more easily grown or more profitable for marketing purposes. Sow in March for early planting, and in June for late.

Beets are easily grown, and very useful and profitable, and will, if properly cultivated, repay the laborer well for his toil. In Europe it is

grown more extensively than any other vegetable for food and sugar-making, as well as for stock. Half of the sugar now used in France and Germany is made of the beet. It keeps well all winter, and is among the first vegetables we find on the table in the spring.

Tomatoes.—The tomato seed should be sown in March and transplanted as early as possible. It will grow well in any kind of soil, and bear till frost. No vegetable is more healthy, and none more prolific in its bearing.

Peas are quite various in kind and method of cultivation. The cow-peas are easily cultivated, like corn or Irish potatoes, or in drills, or even sown broadcast. Poor lands seem to suit them best. They make one of the best of fertilizers when turned under in the green state. The Marrowfat and other climbing peas are more difficult to raise, and are only used for the table.

Celery.—This excellent vegetable, most delicious and wholesome, is coming into more general use than formerly. It is somewhat difficult to raise unless pains are taken to have the seed sown early, and then transplanted in ditches, richly manured, and so made that a hill of soil can be thrown over the celery when it is done growing and is ready for bleaching.

Beans, like peas, consist of innumerable varieties, differing entirely in their habits and modes of life, though all are easily cultivated and very prolific. Whether used as "snaps" or in the berry, they are among our most savory dishes, and probably as healthy as any food used by man.

There are scores of other good vegetables, such as lettuce, spinach, carrots, okra, shallots, thyme, salsify, asparagus, mangoles, parsley, &c., &c., which we can only partly mention in the limited space allowed in this place.

For fertilizing gardens, the formulas used by those who manufacture chemical plant food is certainly preferable to the old system of stable manures, chiefly on account of the annoyance from grass seeds, which always accompany the latter, no matter how well they may be rotted. Chemical fertilizers, on the contrary, are free from all kinds of grass or weed-seed, and can be easily applied without tramping down the beds or injuring the standing plants. Phosphoric acid, potash, and nitrogen are chiefly needed as fertilizers for vegetables, and these can be obtained in the dry salt condition, through the agency of sulphate of ammonia for nitrogen, muriate and sulphate of potash for potash, and superphosphates for phosphoric acid. The quantity needed depends upon the richness

and locality of the garden. For most vegetables, the following formula will answer well, provided the ingredients are well mixed and sown broadcast, and harrowed or plowed in about two or three inches deep.

To produce good vegetables upon half acre of land, use—

Sulphate of ammonia (24 per cent. ammonia), a dry salt	200 lbs.
Muriate of potash (80 per cent. potash), a dry salt	100 lbs.
Sulphate of potash (35 per cent. potash), a dry salt	100 lbs.
Superphosphate (13 per cent. sol. acid), a dry salt	150 lbs.

For a greater or less quantity of land than half an acre, use the articles of the formula proportionally. This will make any ordinary land quite rich in plant food, and produce first-class vegetables of almost all kinds. In using bone-dust, ground bone will always last longest; but dissolved bone (dissolved with sulphuric acid) will always be more easily eaten by the roots of the plant, and give the best results. After a garden is once put into good heart, then the gardener will know what fertilizer is needed each year. Ashes are always good fertilizers, and so is gypsum for vegetables or fruit trees.

That branch of horticulture relating to fruits and wine-making will be spoken of under the head of orchards and vineyards.

AGRICULTURAL SOCIETIES, GRANGES, AND FAIRS.

The first fair held west of the Allegheny Mountains was an individual enterprise, gotten up by Col. Lewis Sanders, at his home adjoining Sandersville, and near Lexington, in Fayette county. The first Durham cattle imported and brought over the mountains belonged to, and were brought into Fayette county by, Col. Sanders, in the spring of 1816, the same year in which he held his fair. The year previous Col. S. had spent in England, and had seen exhibitions of fine stock at the fairs, and felt that similar associations would be of benefit in Kentucky; accordingly, he published in the Lexington newspapers, during the spring of 1816, that "a grand cattle show and fair, free for everybody, would come off on my farm, adjoining Sandersville, on the — day of July, 1816, premiums in silver cups to be awarded."

The novelty of this advertisement brought together a very large concourse of people, not only of Fayette, but of the adjoining counties, who were all anxious to see the newly-imported Durhams, and to learn the progress made in stock-breeding in the State. So great was the success of this enterprise that Col. Sanders was induced to advertise for another and larger "cattle show and fair," to come off in July, 1817, at the same place. Like the first, this was a complete success, and many of the best planters in the State were present. These planters, and the stock-breeders of the adjacent counties, here resolved themselves into a convention for the purpose of forming a State Agricultural Society. They agreed to meet in Lexington, at a fixed time and place, for organization. Such a meeting accordingly took place, when a constitution and by-laws were adopted, and officers elected. Gov. Isaac Shelby was chosen President, and Hon. Thos. T. Barr Secretary. Under this Association "a cattle show and fair" took place in Lexington in 1818, at Fowler's Garden, which was largely attended and fully patronized by the planters and stock-breeders of the blue-grass counties. This State Society held together some four or five annual meetings and then dissolved; but before it ceased to exist, Bourbon county had formed a County Fair Association, which was soon followed by Franklin, Mercer, Jefferson, Mason, and others.

From this beginning, in 1816, we may date the lead which Kentucky has taken and kept of all the other States of the Union in the breeding of fine cattle, horses, hogs, sheep, and other animals, and to Col. Lewis Sanders justly belongs the lasting honor of having inaugurated the move which has made the State head the column among the stock-breeding countries of America. By the influence also of Col. Sanders and other public-spirited stock-breeders, "importing companies" were formed in different counties, through which companies the Blue Grass Regions of the State were stocked with the best breeds of horses, cattle, sheep, hogs, asses, and poultry in Europe, all of which were found well suited to our climate and the native grasses and grain produced on our soil.

On the 3d of February, 1838, delegates from thirty-four counties met in Frankfort and organized the second State Agricultural Society of Kentucky. Hon. Chilton Allen was chosen President; Thos. B. Stevenson, Secretary; Rob't W. Scott, Corresponding Secretary, and Philip Swigert, Treasurer, with a Vice President from each Congressional District. In the constitution, which was adopted, provision was made for

the collection and dissemination of agricultural and statistical information over the whole State; for the award of medals and diplomas to writers of essays on agricultural subjects, and to the inventors and discoverers of objects useful to the farmer or mechanic; and also for the collection and distribution of seeds. It was not contemplated by this Association to hold public fairs or to distribute premiums for excellence of live stock or farm productions, but it was organized simply for the purpose of elevating the mental status of the agricultural classes, and to improve them in the art of farming, and in the use of better implements of agriculture, and to instruct the people in the great laws of nature, through which the best breeds of live stock and the most perfect agricultural crops of every kind could be produced. This Association held three annual meetings at Frankfort, at each of which several excellent essays were read, and afterwards extensively published throughout the State. During the session of the Legislature, in 1840, Hon. James Guthrie, of Louisville, introduced a bill in the Senate to provide for a general plan of incorporating County and State Agricultural Societies, and establishing an Agricultural College and model farm, and appropriating \$6,000 per annum, for ten years, from the State Treasury in support of the same. This bill passed the Senate by 24 to 13, but was lost in the House, the very branch of the government which should have been, above all others, in favor of popular education. The last meeting of this Association, in 1841, asked for an appropriation by the Legislature to aid in the diffusion of the useful information it had collected, which was refused, whereupon it dissolved through want of money to pay the premiums it had so worthily endeavored to provide for in its organization.

The benefits of this Association, however, were too valuable, numerous, and impressive to be forgotten by the farmers, mechanics, and other citizens of Kentucky. Similar institutions had been established in many of the sister States of the Union, and were developing the resources of those States. Gov. L. W. Powell, in 1853, made a direct appeal to the Legislature, in his regular message, asking a direct appropriation of money from the Treasury of the State in aid of her agricultural and mechanical interests, which was warmly renewed by Gov. C. S. Morehead in 1855. This, together with the continual agitation of the subject by the agricultural and local press of the State, brought together a convention of a few earnest advocates in Lexington, about the 1st of January, 1856, which was presided over by Dr. Elisha Warfield. This meeting called another to assemble in Frankfort on the 16th

of January, 1853. This meeting duly assembled at the State House, and was called together by Hon. L. W. Powell, and was presided over by Hon. Jas. F. Buckner.

By this meeting a petition for a charter was presented to the Legislature, then in session. This charter, very liberal in its provisions, was granted, and an appropriation of \$5,000 a year, for two years, made from the State Treasury to pay the officers and the premiums, &c., of the annual fairs to be held within the succeeding two years, and May 21st, 1856, designated in the charter for the organization of the "KENTUCKY STATE AGRICULTURAL SOCIETY."

Accordingly, on that day this Society (the third State Association) was duly organized under its charter, and Hon. Brutus J. Clay chosen President, W. C. Lyle, Secretary, and Hon. Robert W. Scott, Corresponding Secretary.

This Society was patronized by many of the best planters, stock-raisers, and citizens of the State, and held two very large, well attended, and interesting fairs—the first at Paris, beginning on the 30th of September, 1856, and lasting five days, and the second at Henderson, beginning on the 13th of October, and lasting five days. It was estimated that not less than from 15,000 to 20,000 persons were present at each of these meetings. A full, accurate, and highly interesting and well written report of the transaction of this Society, as well as the actions of the County Associations then in existence in the State, together with premium essays, &c., were carefully prepared by Hon. Robert W. Scott, and printed at Frankfort by A. G. Hodges, Public Printer.

Unfortunately for Kentucky, the Legislature in 1858 failed to make further appropriations to aid this very finely appointed State Agricultural Society; and, as a matter of course, it ceased to exist as an active organization. It left in the field, however, many County Associations formed after the model of the State Society.

The civil war, which soon followed, broke down, for the time being, all Agricultural Associations, and left the planters and mechanics without organization of any sort. However, when the civil strife had ceased, and peace and good will once more pervaded the land, many of the old County Associations were revived, and new ones organized, so that now there is a separate Fair Society in most of the prominent counties in the State. A list of these Fair Associations I will here insert. So far as I have been able to get information, this list is correct as to names, location, and officers, though doubtless new officers have been chosen in the place of some of those here mentioned. The officers are very slow in giving this Bureau reports from their Societies:

FAIR ASSOCIATIONS IN THE STATE OF KENTUCKY.

NAMES.	Name of President.	Name of Secretary.	P. O. address of Sec'y.	Name of county.
1. South Kentucky Fair Grounds Association.	C. Dipp.	G. Coke	Glasgow	Barren.
2. North Kentucky Agricultural Society.	J. C. Jenkins	E. A. Tucker.	Florence	Boone.
3. Bourbon County Agricultural Society.	B. J. Clay	W. A. Parker.	Paris.	Bourbon.
4. Breckinridge Agricultural and Mechanical Asso.	N. L. Hensley	A. M. DeJemette.	Hardinsburg	Breckinridge.
5. Carroll County Fair Association.	A. Donaldson.	J. A. Donaldson.	Carrollton	Carroll.
6. Christian County Agricultural and Mechanical Asso.	E. A. Starling.	W. P. Winell	Hopkinsville	Christian.
7. Beverly Farmers' Club.	G. M. Quarles	M. D. Davie	Beverly.	Christian.
8. Daviess County Fair Company.	G. W. Leet.	E. F. Moorman.	Owensboro	Daviess.
9. Central Kentucky Fair Club.	I. C. Vannmeter	J. M. Tipton.	Lexington	Fayette.
10. Kentucky Industrial Association.	Scott Brown.	E. M. Drane.	Frankfort.	Franklin.
11. Harrison Agricultural and Mechanical Association.	T. J. Megibben	R. Collier.	Cynthiana.	Harrison.
12. Farmers' Home.	I. F. Sharon	J. L. Henry.	Royd's Station.	Harrison.
13. Green River Agricultural and Mechanical Asso.	B. M. Lively	J. M. Brents	Munfordville	Hart.
14. Henderson Fair Company	J. Funk	T. T. Barrett.	Henderson.	Henderson.
15. Eminence Agricultural and Mechanical Association.	W. S. Pryor	J. H. Moore	Eminence.	Henry.
16. Cumberland River Agricultural Society.	W. McVey	J. C. Sproull	Bryant's Store.	Knox.
17. Lincoln Co. Farmers' Club and Horticul. Society.	J. S. Murphy.	H. T. Harris	Stanford	Lincoln.
18. Lincoln County Stock Association.	J. A. Harris	G. H. McKinney.	Stanford	Lincoln.
19. Logan County Farmers' Club.	S. A. Grinter.	W. Morton.	Russellville	Logan.
20. Paducah and McCracken Agricultural Association.	J. Sinnott.	L. W. Emery.	Paducah	McCracken.
21. Union Agricultural Ass. of Mason and Bracken	J. F. Best	J. M. Nolin.	German town	Mason.
22. Mercer County Agricultural and Mechanical Asso.	W. E. Cleland	J. H. Lapsley.	McAfee.	Mercer.
23. Nelson County Agricultural Asso.	L. McKay	B. J. Rogers	Bardstown	Nelson.
24. Ohio County Agricultural and Mechanical Society.	J. W. Barnett.	S. K. Cox	Hartford	Ohio.
25. Union Agricultural and Mechanical Association.	A. McNeal.	J. P. Smith.	New Liberty	Owen.
26. Pulaski County Agricultural and Mechanical Asso.	S. R. Owens	F. M. Cox	Somerset	Pulaski.
27. Scott County Agricultural and Mechanical Asso.	C. J. Graves	H. S. Parks.	Georgetown.	Scott.
28. Shelby County Agricultural and Mechanical Asso.	A. Middleton	L. W. Smith	Shelbyville	Shelby.
29. Simpson County Agricultural and Mechanical Asso.	T. Stringer	J. B. Montague.	Franklin	Simpson.
30. Bell's Chapel Farmers' Club	B. Downer	J. F. DeWitt.	Elkton	Todd.
31. Warren County Agricultural and Mechanical Asso.	J. W. Eubank	H. L. Underwood.	Bowling Green.	Warren.
32. Society Kentucky Fruit Growers' Association.	W. Cook.	W. C. Brashear.	Bowling Green	Warren.
33. Washington County Agricultural Society.	E. B. Browne.	T. R. Browne.	Springfield	Washington.
34. World's Fair	Pat. Dolan	A. S. Drake.	Lexington	Fayette.

The "Bureau of Agriculture, Horticulture, and Statistics" was established by an act of the Legislature at its last session, and Winston J. Davie, the present Commissioner, was appointed to that office by Governor Jas. B. McCreary in the month of May, 1876. Since that time, monthly reports of the crops, live stock, &c., of the State have been prepared by the Commissioner, and published in the newspapers, and the *Annual Report*, of which this article is a part, has been prepared for general circulation. The Commissioner has also published a pamphlet of 108 pages, upon the "Resources and Condition of the Commonwealth of Kentucky," for free distribution to emigrants and emigration societies. This pamphlet has been extensively circulated throughout parts of Europe, and the Northern States of our own country, and has created a very large inquiry for lands by parties desirous of becoming citizens of our Commonwealth. My correspondence on the subjects connected with immigration has grown to be quite extensive, and is constantly increasing.

I copy below the act of the Legislature creating this Bureau:

"CHAPTER 1000.

"AN ACT to establish a Bureau of Agriculture, Horticulture, and Statistics.

"§ 1. *Be it enacted by the General Assembly of the Commonwealth of Kentucky*, That a Bureau of Agriculture, Horticulture, and Statistics for the State of Kentucky be, and is hereby, established.

"§ 2. That said department shall be under the control and management of one officer, who shall be known as the Commissioner of Agriculture, Horticulture, and Statistics. He shall be appointed by the Governor, by and with the advice and consent of the Senate, if the Senate is in session, and shall hold his office for two years, commencing on the second Monday in January, and continue for the period of two years, and until his successor is appointed. He shall keep his office at the seat of government, and shall take an oath well and truly to discharge the duties of his office, and execute bond to the Commonwealth, with good security to be approved by the Governor, for the faithful discharge of the duties of his office. The business and efforts of said Bureau shall be directed to the promotion of agriculture, horticulture, manufactures, and other matters provided for by this act.

"§ 3. It shall be the duty of said Commissioner to promote and encourage as far as practicable the organization of Agricultural and Horticultural Societies and other associations in the several counties in this

State; also to ascertain the agricultural, horticultural, mechanical, commercial, and educational condition of every county in the Commonwealth, giving in detail the quantity and quality of land under cultivation; the kinds, amounts, and value of the annual field crops; the annual production of orchards, gardens, dairies and mines; the quantity and value annually of the domestic manufactures; the kinds and value, and the increase of the live stock; annual products of mechanical industry and skill; the value of the exports and imports; the number of miles of railroad, turnpikes, and navigable streams; the names, locations, and populations of cities, towns, and villages; the number and value of school-houses and churches; the names, number, capital, and purposes of incorporated companies and charitable institutions, together with such other vital, social, physical, and political statistics as he may deem proper and expedient.

“§ 4. It shall be the duty of the Auditor of Public Accounts, the assessors of the several counties of the State, and all other officers of the State, or any of the counties thereof, to furnish said Commissioner with such information within their power, respectively, as the said Commissioner may require in regard to the matters connected with said Bureau; and as a further means of procuring said information, the Commissioner shall put himself in communication with the different Agricultural and Horticultural Societies, and manufacturing and mining companies, and such other organizations, either in or out of the State, as he may deem expedient.

“§ 5. It shall be the duty of the Commissioner to furnish to the publishers of newspapers of this State, who will publish the same free of charge, a condensed monthly report of the breadth of planting and condition of the growing crops, and such other information as he may deem proper and expedient.

“§ 6. The Commissioner shall annually, on the first of January, make out and compile a report, giving a general review of the agricultural, horticultural, mineral, and industrial resources of the entire State, with brief notices of each county, and shall file the same with the Governor of this Commonwealth, who shall cause to be printed a sufficient number for general distribution. It shall be the duty of the said Commissioner to prepare, as soon as he may be possessed of the proper information, a condensed statement of the present condition and capacity of the State as regards its agriculture, horticulture, mining, manufacturing, and domestic arts; the average price of lands and labor in its different sections;

its traveling, exporting, and educational facilities; a brief view of its climate; its geographical position and general topography, and other suitable subjects designed to induce immigration to this State; which statement, in the form of a report, when presented to the Governor, and approved by him, the said Commissioner shall cause to be printed, in cheap pamphlet form, in the English and German languages, and distributed free through immigration societies, or otherwise, as he may deem best to promote immigration into this State.

“§ 7. It shall be the duty of the Librarian to furnish said Commissioner with all necessary stationery for the use of his office, and the Governor shall assign to said Commissioner suitable rooms, with necessary furniture and fixtures, for the transaction of the business of said Bureau.

“§ 8. It shall be the duty of the Contractor of Public Printing to do and perform the necessary printing required by said Commissioner for the use of said Bureau, at the same charges and upon the same terms as similar work is done for the State.

“§ 9. The Commissioner shall make out a monthly account of the postage, light, and fuel expenses of his office, and submit the same to the Governor for his approval, and upon said approval he shall authorize the Auditor of Public Accounts to draw his warrant on the Treasurer for the said amount.

“§ 10. The salary of the Commissioner shall be two thousand dollars per year, to be paid monthly out of any money in the Treasury not otherwise appropriated.

“§ 11. The Commissioner first appointed under this act shall hold his office until the second Monday in January, 1878, and until his successor shall be appointed and qualified; and should there occur a vacancy by death, resignation, or from any other cause, the Governor shall have power to fill such vacancy.

“§ 12. This act to take effect and be in force from and after its passage.

“Approved March 20, 1876.”

This act, as it now stands, is prolix and somewhat incomplete, but will no doubt be so amended, at the next session of the Legislature, that this Bureau can be made far more useful to all classes of citizens in the State. The reports issuing from this office are eagerly sought for and approved by many of the leading merchants, merchants' exchanges, emigration societies, State and county agricultural societies, and farmers throughout the United States.

Granges.—The society or union, known as the “National Grange of the United States,” or “Patrons of Husbandry,” has in Kentucky a State organization, of which Hon. Montgomery D. Davie is State Master; Col. J. Eugene Barnes, Secretary; and James M. Clark, Treasurer. The subordinate Granges number about 1,600, with a very large membership of both males and females. These subordinate Granges or lodges meet monthly, or semi-monthly, in their lodge-rooms or Granges, and there discuss all questions relating to agricultural pursuits, horticulture, fruit-growing, live stock, education, political economy, private and public finances, hygiene, general morals, and all other subjects which may affect the interest, well-being, and prosperity of man. The *institution* is a great self-acting *university*, in which every member is both a teacher and a pupil. No party politics, political nominations, or religious sectarianisms are admitted or allowed within the Grange, nor to emanate from it; but the great tree of scientific advancement is there planted, where all members may pluck of its fruits and rest beneath its shade. The momentum that has been given to agriculture as a science, and information imparted to the people (even those not belonging to the order), from its discussion on subjects of scientific importance in agriculture, mechanics, trade, commerce, and political economy, have been felt throughout the United States and Europe, and no doubt will, in the future, greatly promote the rapid advancement of the whole human family in knowledge and happiness. The universally humanitarian doctrines taught necessarily bring opposition upon this order from those persons who delight in controlling the ignorant masses (whom they wish to keep ignorant) by cliques, and through the power of large moneyed corporations and monopolies; because the interests of monopolists and privileged classes are always opposed to enlightenment and the general spread of information, particularly upon all subjects relating to labor and finance. Other opponents of the order are usually those who are themselves prejudiced, through ignorance, of the motives of the members of the order, or else believe they stand in the way to their political or pecuniary advancement. These, if honest, however, would certainly cease their opposition to this great agricultural society, if they would but recollect that it never meddles with party politics or religion, and only endeavors to teach and act with justice, love, and the broadest humanitarianism towards every member of the human family. The secret workings of the order is simply for their own well-being as an organization, and not at all antagonistic to the rights or interests of one single individual on earth.

The order has done great good in making improvements on the old effete systems of agriculture, and by introducing new machinery and fine-blooded stock into the State, as well as by adding intelligence and general education to the isolated farmers, and restoring good feeling and social fellowship to citizens who were estranged through the operations of the late civil war.

At present the order is in a good, healthy condition, and bids fair to be of still greater benefit to the working classes of the country, as well as to every industry in the land.

*GRAPE CULTURE IN KENTUCKY.

HISTORY OF GRAPE CULTURE—ITS ANTIQUITY AND PROGRESS—ITS IMPORTANCE, AND STATISTICS OF WINE-MAKING IN EUROPE AND IN THE UNITED STATES—PARASITES AND DISASTERS TO WHICH THE VINE IS SUBJECT—VARIETIES AND PECULIARITIES OF THE GRAPE—BEST SYSTEM OF CULTIVATION.

There is a peculiar fascination in the *culture of the grape* and in wine-making, which has existed among the nations inhabiting Southern Europe and Asia Minor from the days of Noah to the present time. In all this region, no other crop, except that of breadstuffs, equals the grape crop in value. The culture has been kept up many centuries, and out of a single species (*vitis vinifera*) more than two thousand seedling varieties have been produced.

Both science and skill have brought the cultivation to its highest stage of perfection, and vineyards have been extended to the utmost bounds of all productive countries in the Old World. The inhabitants consume annually large quantities of grapes, esteeming them as a nutritious and wholesome food, whether used fresh from the vines or dried into raisins.

*I am indebted for this excellent article upon Grape Culture to one of the best practical grape-growers, and one of the most graceful and forcible agricultural writers in the State, Thomas S. Kennedy, Esq., of Jefferson county, near Louisville, Ky. Mr. K. was elected at Baltimore, in Sept., 1877, Vice President for Kentucky of the American Pomological Society.

The larger portion of the crop is, however, devoted to the *production of wine*, the manufacture of which is a special business, requiring great skill and experience, of a very different character from that necessary for the cultivation of the vine and the care of the crop.

The great value and importance of the wine crop in Europe can be estimated by examining the statistics of the *wine crop of France*. This crop in 1875 amounted to 1,839,904,000 gallons. The value of this single crop, at twenty-five cents per gallon, would be \$459,975,800—an amount much larger than the value of the wheat crop of the United States, which, for 1877, is estimated at 325,000,000 bushels, being the largest crop ever grown in this country.

The production in 1875, however, was above the average of the French wine crop, which for the past ten years has averaged 1,198,958,000 gallons per annum. This production shows, then, an annual average income of \$300,000,000 to the people of France for wine alone, exclusive of the vast quantities of grapes consumed as food by forty million people.

If to these estimates of the value of the French grape crop there shall be added the crops of grapes annually gathered in Germany, Austria, Italy, Portugal, and Spain, it will be found that the grape crop of Southern Europe is worth, for table use, raisins, and wine, every year, more than \$500,000,000.

A crop that yields such golden revenues, and gives employment to millions of people, must be of great value to any country where the grape can be successfully and profitably grown. With this high appreciation of the grape crop, the early settlers of America commenced planting vines from Europe more than two centuries ago. After continued efforts and constant failures for two hundred years, the culture of the European grape on the American continent was finally abandoned. The French and Spanish and Italian settlers, up to the year 1800, had totally failed to establish successful vineyards and build up a profitable wine trade either in Mexico, in the West Indies, or in any of the States bordering on the Gulf of Mexico or on the Atlantic coast.

At the beginning of the present century seedlings from the foreign grape were tried; and then again from these home-grown seedlings a new lot of seedlings were grown, in the hope that a good, hardy, acclimated grape would be obtained, suited to the soil and climate of this country. In this way some delicious table grapes were produced, but the vines were too tender to be grown in the Northern States.

The accidental discovery, about fifty years since, of two native seedling vines, of the *Labrusca* variety, that produced *good grapes*, and which were found to be hardy and productive, created a new era in grape culture in the United States. These seedlings (called the Isabella and the Catawba) were eagerly sought for and largely planted. Under garden culture they proved most satisfactory, and they were grown with success as far North as New York.

Mr. Nicholas Longworth, of Cincinnati, became enthusiastic at the prospect of this becoming a great wine-growing country, and about 40 years ago he planted extensive vineyards about Cincinnati, and soon afterwards many other vineyards were planted throughout the West and Southwest. Under the impulse thus given to vineyard culture, new seedling varieties of the American species of grapes were grown and tested, until more than fifty good kinds of grapes were obtained, some of which were of excellent quality for table use.

The next step in the improvement of the American grape was made by Mr. Rogers, of Salem, Massachusetts, who succeeded, about twenty-five years since, in crossing the European grape with the hardiest and most vigorous of the American varieties. The seedling grapes produced were of different kinds, and some of them were of the highest quality for table use, especially the hybrids obtained by impregnating the stigma of the flower of the "Northern Fox," or parent of the *Labrusca* family, with the pollen of the Black Hamburg and Chasselas varieties of the European or *Vinifera* family.

This brief history is thus rapidly glanced at in order to show the condition of grape culture about a quarter of a century ago in this country and its present status. The rapid growth of the United States in territory and population since then has caused the experiment of grape culture to spread over new areas of soil and climate; and their capability for the growth of this delicious fruit, both for wine and table use, to be extensively tested.

The total result of all these efforts can be learned by an examination of the census report for 1870, where it is stated that the whole annual *production of wine* in the United States amounted to only 3,092,330 gallons. This quantity, it will be noted, is quite an insignificant result, after such great and long-continued efforts to produce wine in this country. The annual wine crop of France is four hundred times as large; and of the three million gallons produced in 1870 in the United States, nearly two thirds of the quantity were made in California, leaving only

a fraction over one million gallons for the production of all those parts of this country where, during the past two centuries, the greatest efforts have been made to cultivate grapes for wine.

The production of wine in 1870, by States, was as follows, to-wit:

California.	1,814,656 gallons.
Missouri.	326,173 "
Ohio	212,912 "
Illinois	111,882 "
Pennsylvania	97,165 "
New York.	82,607 "
Kentucky.	62,360 "
North Carolina.	62,348 "
Iowa	37,518 "
Connecticut	27,414 "
Virginia.	26,283 "

These are the leading States.

The experience of the past six years, since the date of the census report for 1870, has proved the remarkable adaptation of the soil and climate of *California for vineyard culture*; and the production of wine in that State has increased from less than two million gallons in 1870 to an annual average amounting to nearly ten million gallons. The wines produced in California are of the same kinds, and from the same varieties of grapes, as the wines made in Europe; and not only do the European wine grapes grow in luxuriance there, but also the more delicate table grapes, such as the Black Hamburg, the Chasselas, and Muscat varieties, each of which attains the largest size and the most luscious flavor. Thus California has succeeded in growing the European grape, and bids fair to rival the most favored regions of Europe in the production of wine, while on this side of the Rocky Mountains all efforts have ended in partial failure and disappointment.

The only portion of the middle section of the United States that has not fallen off in the production of wine since the last census report is a small region in Ohio, contained in the two counties of Erie and Ottawa, and located near the head of Lake Erie. This grape district embraces several small islands in the lake, and a strip of land on the shore.

In 1874 the district produced a crop of 9,591,403 pounds of grapes, which was valued at six cents per pound. The wine pressed from the crop of 1874 amounted to 685,547 gallons, showing a large increase on the census report for the whole State of Ohio. But even in this successful district there has been a falling off in the yield of the vineyards,

which formerly furnished fully two tons of grapes to the acre, but which now yield not over one ton per acre.

The quality of the grapes is much inferior to the same kinds grown in Kentucky. The flavor is watery and acid. Each gallon of wine requires an average of 11 ½ pounds of grapes.

This small district, generally known as *Kelley Island vineyards*, is the only section of the Mississippi Valley that seems to have been free from the casualties that have overtaken the vineyards elsewhere in the valley. In all other sections the history of the vineyards is the same. For a few years the vines flourish luxuriantly, and bear prolific crops. Then mildew and the rot attack the grapes, reducing the quantity of ripened fruit more and more every year. Then the vines seem to sicken and become diseased in some mysterious manner, until finally they die out entirely. The fatality was attributed to the variety cultivated, especially the Catawba. Consequently new kinds were planted and carefully cultivated. But one after another of these new kinds have *failed to bear crops* in a few years; and now it is reported in Southern Ohio "that even the hardy and vigorous *Ives Seedling*, which it was hoped would prove a success, is beginning to show signs of disease and decay."

Another supposed cause of the failure of the vines was attributed to the *system of pruning*, and long controversies have been published in regard to the best mode of pruning and training the vine. Consequently, some adopting one way and others a different mode, every system of pruning has been experimentally tried without remedying the evil.

The grape-growers on Lake Erie have adopted the system of growing about three canes from a stump of old wood a foot high. These canes are cut about three feet in length, and are spread in fan-shape on a wire trellis. While these canes are bearing fruit one season, new canes are allowed to grow from the old stump. These new canes are to take the place of the old canes in bearing fruit the next season. Thus, after numerous experiments, the French system of pruning has come again into vogue, although many grape-growers think the severe pruning weakens too much the strong-growing American varieties.

I believe good cultivators have *abandoned summer pruning* and pinching, except when necessary to check immoderate growth. A heavy mass of foliage growing over and about the clusters of fruit is regarded as essential for the proper ripening of the grapes by the action of the leaves in evaporating the sap and causing other chemical action, and also for protecting the fruit from the deleterious action of the heavy autumn dews and the scalding rays of a hot sun.

The mildew and rot are mysterious diseases that have to be endured, as no specific remedy has been found for them. The causes of these diseases are still a subject of speculation and controversy. Some culturists maintain that a diseased action in the growth of the vine and in the flow of sap is produced by excessive pruning in either the roots or branches, thereby causing a disproportion in the upper and lower circulation.

Other cultivators think the rot is caused by stagnant water in the sub-soil, especially heavy clay soils; and others again suppose the cause to be wholly owing to the excessive humidity of the atmosphere from rain showers and fogs, occurring during a spell of hot, sultry weather, when the grapes are maturing their growth and full of sap. Whatever may be the cause, the disease is followed by, if not caused by, a fungus that spreads rapidly over the berry, and extends the ravages of the disease to all berries in contact with it. This fungus can be destroyed by the free use of finely-powdered sulphur, thoroughly dusted over it.

It will be admitted by all grape-growers that *young vines* bear good crops, without any loss from rot, for the first few years after coming into bearing. This fact has led to the suggestion that the rot may be avoided by layering young wood and growing a *new vine every few years* alongside the old vine, which is to be dug up and destroyed as soon as the young vine is old enough to bear fruit. Thus a vineyard can be kept in vigorous and healthy condition all the time, as the old vines, as soon as they begin to become weak and worn out, are removed and young and strong vines take their place.

A somewhat similar practice to this suggestion has prevailed in France for many years, and is there styled the system of *provinage*. In France the vines are renewed once in twelve or fourteen years, or oftener if necessary, and large quantities of stable and other manures are annually used in fertilizing the vineyards. The richest and best wines are grown upon soil *so strongly mixed with lime* "that an acid causes a brisk effervescence when poured upon it."

A writer describing the famous *Cote d'Or* district, says: "Nearest the top of the ridge the soil contains a larger proportion of lime, and this in general yields the driest and best wine. On descending the clay begins to predominate, and the wine gradually falls off in quality till it becomes the *vin ordinaire* of the country."

These facts have no doubt been too much overlooked in this country, viz:

First. That the subsoil of a vineyard should be *well drained*, and the surface well cultivated and kept fertile by the application of lime, bone-dust, and other fertilizers.

Second. That the vines should be renewed more frequently than has been done; and in renewing, and even in the annual pruning, *the old vines, roots, and cuttings, should be burned*, so as totally to destroy the eggs of insects and the germs of fungi that may be attached to them, all ready prepared to start a new crop of diseases and destructive depredators the next season.

The insects that prey upon the grape-vine are several varieties of beetles, caterpillars, and leaf-rollers, which are generally destroyed by hand-picking before much *apparent* damage is committed by them.

The curculio also is a great nuisance. It punctures the berry, which does not fall off, but remains on the bunch. The egg deposited soon hatches and the larva remains in the berry, feeding and fattening until the grapes are ripe.

I have long used *small bags* made of musquito netting to envelop each bunch. These bags are tied or pinned over the grapes when about half grown, and remain on until the ripe grapes are gathered. They have proved a perfect protection from insects, such as wasps, hornets, bees, spiders, curculios, &c.; and *in some seasons have prevented the rot.*

One piece of netting, eight yards long by two yards wide, costing one dollar, will make 200 bags, which will last for several seasons. Any one who will try the bags will be convinced that the superior condition of the grapes protected by them, fully repays the trouble and expense. The French people bestow constant care and attention on the growing fruit, and we should not expect to succeed without any trouble at all. A new enemy to the grape-vine has lately appeared, under the name of the

Phylloxera vastatrix.—It is a species of *aphis* or plant-louse, having “two forms of life—being found sometimes in galls on the leaves, and at others in excrescences on the small roots or radicals of the vine.” The insects are described, on the authority of Prof. Riley, “as bringing forth their young alive, like other aphides, for several generations; and the parthenogenesis ends by the production, in the fall, of winged females, and these lay eggs which hatch perfect insects of both sexes, which pair, and the cycle is again begun. The eggs are laid sometimes in the cracks in the surface of the ground, and at others on the buds and branches of the vine. The winged females begin to appear in July, and continue to appear till the growth of the vine is stopped by frost.

No certain remedy or preventive has been found, although large rewards have been offered for one by the French Government."

The large reward offered for a remedy against this destructive insect is only one of the numerous instances illustrative of the great promptness and vigilant care of the French Government in promoting and protecting the agricultural interests of France. The agriculturists in this country are not the recipients of any special favors from the Government, and yet the prosperity and growth in wealth of the whole nation are mainly dependent upon the development and successful prosecution of this important branch of industry. Agriculturists have never been clamorous for political favors and protection, and hence their want of influence in the legislative councils, whether State or national.

Personally I am not acquainted with the phylloxera, and I confess that the accounts of its destructive ravages have confused me not a little. A writer in the "Country Gentleman" states that a friend of his has been financially ruined by the insect. The friend, after accumulating by hard work during many years a moderate fortune, invested his money in a piece of land and in building thereon some of the finest green-houses in the United States. Expensive borders were prepared and planted in grape-vines. For three years the vines, which were of European varieties, grew vigorously, but this, the fourth year, the phylloxera appeared in such vast numbers as to destroy the vines, literally eating up the roots and filling the earth with a living mass of insects. The writer says: "A vine was lifted so that we might examine the roots; and there, sure enough, the phylloxera swarmed in heaps, tumbling over one another like mites in cheese."

"The amount of money expended in building, border-making, and furnishing such a house as this grapery, and the four years of labor, firing, &c., spent almost for nothing—in fact, far worse than nothing—as further grape-growing is rendered impracticable on the place, is very crushing to a man who has expended his all—the fruits of thirty years' sweat—in the endeavor to earn an honorable livelihood." This greenhouse is located in New England; and Prof. Ed. Burgess, of the Boston Society of Natural History, to whom some specimens of the vine roots were submitted by Prof. Sargent, says of them: "I find aphid skins and eggs on the roots, and no other aphid than the phylloxera is known to attack the grape."

The mystery to me, in regard to the descriptions of the phylloxera and its rapid destruction of vines, as well as the indestructibility of the

pest, arises from several facts of my own experience. Seven years ago a blackish-brown species of aphid, much larger than the green plant louse, appeared in my vineyard, and in a few days literally covered the ends of all the young branches with a black mass of insects. I cleared most of them out of the vineyard by cutting off the branches very carefully, so as not to disturb the insects, and then burning the insects and branches. There must have been several pecks of insects destroyed, so numerous were they, and at least one fourth as many more remained scattered about on the vines. These in a week or two entirely disappeared, and have not reappeared since. This is the only time I have ever seen this species of aphid; and if it is true that the phylloxera is the only species of aphid "that is known to attack the grape," the question has occurred to my mind, was this the phylloxera? and if it was, then what was the reason it disappeared and has given no evidence of its depredations upon the roots of the vines during the last seven years?

It is said, too, that in another stage of life, the phylloxera attacks the leaf by forming galls thereon. Now I have on my grounds an arbor upon which several vines grow. I purchased them as *Ohio Cigar Box vines*, but they proved to be spurious and worthless for fruit. They were of the *Æstivalis* species, with thin leaves. Finding the true character of the vines, I allowed them to spread at liberty over the top of the arbor, where they soon formed a dense, shady roof. The old wood was not pruned away, and consequently it became a harbor for some kind of insect which has for some years past punctured the leaves, and literally covered them over, during the summer, with a net-work of galls. Upon these vines I have not observed any aphides, nor even the insects that formed the leaf galls; but having seen the statement that the phylloxera produced these or similar leaf galls, I have just cut down the vines even with the ground and burned them. The leaves, at the time the vines were cut down, were unusually full of galls, as the insects have evidently rapidly increased from year to year; but I have never been able to discover any insect either forming the galls or, indeed, upon the leaves, except an active, greenish-white cricket, about three fourths of an inch long, very slim, and with long delicate legs and antennæ. These crickets seemed to be feeding upon the larva in the galls, which I found to be a small white worm, the color and size of a piece of cotton sewing thread, about one fourth of an inch long. Now again, I am puzzled with the question, are these leaf galls made by the phyl-

loxera? And if so, why have they not spread all over the other vines on the arbor, and eaten up the roots? Even the infested vines seemed not to mind the leaf galls, and grew on as vigorously and as rampant as ever. I have carefully examined the roots of these vines, and do not find any traces of insects upon them or in the soil.

There is, however, *an enemy of the grape-vine*, about which I have never seen any notice in the books. It preys upon the tender young shoots by scraping the bark from the wood in a space about one fourth of a square inch. In the centre of this cleared space a hole is bored through the exposed green wood to the pith, and an egg is deposited therein. The location of these nests for the eggs is generally an inch or two above a joint, and there may be a nest near every joint of a young branch. The insect scrapes the bark away, so that the green wood may be exposed to the action of the air and sun. As the wood dries and shrivels, it cracks open, and the bark around the edges of the cleared space thickens, assumes a dark color, and cicatrizes. Thus the wound becomes prominent, and is easily discovered. As soon as the egg hatches, the grub or larva begins to cut its way downwards through the pith. At the first joint it rests awhile and grows, and then cuts its way on down to the main stem, feeding, doubtless, upon the pith and sap, and gradually changes from a small white worm to a stout brown one, about an inch long. I am of the opinion that this worm is the larva of a beetle, probably the *spotted pelidnota*, which is nearly the size of the common "June-bug," with wing-covers of a dull brownish yellow or buff color, spotted on each side with a row of distinct black dots.

I may be mistaken, however, in supposing the worm to be the larva of this particular beetle; but there is no mistake in regard to the worm itself and its progress down the pithy heart of the branches. During the growing season, I have never observed that the presence of the worm in the branch and its ravages were injurious to the branch or to the fruit upon it; and as the branch was taken off in pruning at the end of the season, and the worm removed with it, as I supposed, I have been content to let it abide awhile before sealing its fate. Mr. W. A. Richardson, of Ivywood, near Louisville, informs me, however, that, in digging up some Catawba vines that were sickly and diseased, he discovered in the centre of the main stem, at its junction with the roots, just such brown worms as I have described; and, upon examination, he found every vine similarly infested, the pith being entirely gone and the stem perfectly hollow throughout its entire length. He attributed the loss of

his vines to these worms, and thinks that they are the cause of the decay of the vineyards generally throughout the country. The attention of cultivators should be directed to the more thorough investigation of this depredator, that works concealed in the heart of the vine.

In regard to *planting vines*, I have found eight feet between the vines in the row, and the same space between the rows, full close enough for cultivation and proper growth.

The text-books on Grape Culture, and the many descriptive catalogues gratuitously distributed by nurserymen who grow vines for sale, contain very full details as to the preparation and cultivation of the soil, the different modes of pruning and training the vines, and also descriptions of the different *varieties*.

These catalogues are both instructive and interesting, and contain the very latest information in regard to grapes and their culture, as new editions are issued every year. The more enterprising nurserymen advertise in the agricultural papers, and from these advertisements their address can be obtained. As most of these catalogues are issued by nurserymen whose experience is confined to a climate much colder than that of Kentucky, they will be found to recommend varieties of grapes because they are hardy in the Northern States. Southern varieties, which will ripen their fruit here, but will not ripen further north, are not generally recommended in these catalogues. It will, therefore, not be out of place to give a list of good grapes which will ripen in Kentucky, and are worth cultivating, and also a list of grapes which will ripen, but are inferior in quality, and are not worth planting. Having tried in my vineyard some seventy varieties, I will confine the lists to my own experience :

LIST OF GRAPES FOR GENERAL PLANTING IN KENTUCKY.

Concord,	Herbemont,
Creveling,	Elsinburgh,
Catawba,	Le-Noir,
Delaware,	Norton's Virginia,
Diana,	Ives,
Hartford,	Venango,
Isabella,	Salem.
Clinton,	

FOR GARDEN CULTURE.

Rogers' Hybrids, as follows :

Goethe (No. 1),	Agawam (No. 15),
Massasoit (No. 3),	Merrimac (No. 19),
Wilder (No. 4),	Lindley (No. 9),

No. 5, No. 12, No. 33, No. 34, No. 39, No. 41, No. 43, No. 44.

Martha,	green colored.	Alvey,
Anna,	"	Lincoln,
Cassiday,	"	Tuley,
Taylor's Bullitt,	"	Adirondac,
Maxatawney,	"	Israella,
Pauline,		Union Village, or Ontario,
Mexican Fox,		Ohio Cigar Box,
Offer,		Burgundy,
Iona,		Devereux, or Black July.

INFERIOR IN QUALITY, OR POOR BEARERS, AND NOT WORTH PLANT- ING.

Allen's Hybrid (winter kills),	Lydia,
Rebecca,	Louisville Seedling,
Manhattan,	Alexander, or Cape, or Schuylkill,
Cuyahoga,	Canby's August, or York Madeira,
Golden Clinton,	Emily,
Logan,	Clara,
Marion,	Hyde's Eliza,
Oporto,	Louisa,
To Kalon,	Scuppernong (winter kills),
White Columbia,	King.

There are *other varieties, highly recommended*, which I have not planted, or which have died out in my vineyard before fruiting. Some of them are very fine grapes, and are worth trying under garden culture:

Arnold's Hybrids, as follows: Autochon, Brant, Cornucopia, Canada, and Othello.

Underhill's Seedlings, as follows: Black Defiance, Irving, Croton, Senasqua, and Underhill's Seedling.

Geo. W. Campbell's Seedlings, as follows: Lady, White Delaware, Concord Chasselas, and Concord Muscat.

Also, other new or not tested varieties, as follows: Belvidere, Black Eagle, Elvira, Eva, Eumelan, Hine, Janesville, Lewis, Telegraph or Christine, Triumph, Talman, Weehawken, Walter, Worden's Seedling, Whitehall, Graham, Mary Ann, Miles, Wilmington, Brighton.

The following list contains *varieties of grapes* which are *not recommended* by some who have tried them, or are inferior in quality, or are only of local reputation:

Arkansas, Albino or Albiness, Allair, Baxter, Blue Favorite, Chipewa, Cynthiana, Missouri, Cloantha, Cowan, Early Hudson, Fancher, Franklin, Garrigues, Gravel Grape, Meade's Seedling, North America, Perkins.

From the foregoing lists, more than *fifty good varieties* of grapes can be selected, affording every shade of color, every size of berry and bunch, and every kind of flavor. Many of them ripen at different times, and thus form *a succession of good eating grapes* from the first of August to the middle of October, and by care the grapes can be kept in good condition until Christmas. No fruit is more wholesome or more delicious; and no family should neglect planting as many vines as they have room for in the garden. For a selection of two dozen vines, I would recommend the following as affording a variety and a succession of grapes:

- 2 Creveling; very sweet and early.
- 1 Ives; next to ripen.
- 4 Delaware.
- 2 Concord.
- 1 Elsinburgh.
- 1 Herbemont.
- 2 Le-Noir.
- 2 Salem.
- 1 Venango.
- 1 Rogers No. 34; very large and splendid.
- 1 Martha or Lady.
- 2 Catawba.
- 1 Goethe.
- 1 Wilder.
- 1 Agawam.
- 1 Merrimac.

If to these sixteen varieties there should be added the large plum-like berry of the Mexican Fox and the wax-like, bronze-colored berry of the Offer, then the selection will embrace an assortment of every shade of color, of every variety of bunch, and of every size of berry, that will make a beautiful and attractive collection of grapes for the table or for exhibition.

It may seem inconsistent to first demonstrate, as has been attempted in this article, the failure of all efforts in the West, except in a limited district, to establish permanent and profitable vineyards for wine, and then advocate the culture of grapes for family use and for market sales. I admit that I may be too enthusiastic in regard to grape-growing, and confess that the pursuit has afforded me much real pleasure and gratification; and I am satisfied, from my own experience, that others, at a

small cost of trouble and attention, can enjoy equally as much pleasure in this interesting occupation as I have had.

It is possible, too, that the causes of the failures hitherto in vineyard culture may be better understood and remedied, and, at all events, grapes, under the more careful attention of garden culture, have been grown quite successfully and satisfactorily. Upon the many hill-tops in Kentucky there may be found suitable locations for profitable vineyards; and it should be remembered that in France it has been proved that the nearer the top of a ridge or a hill, the better the grapes and wine in quantity and quality. But an elevated location is not the only consideration. The following rules should also be observed, viz: If the subsoil is not sand or gravel, it should be under-drained. In France many of the best vineyards have a subsoil of shells and chalk, into which the roots of the vines cannot penetrate, and they therefore spread out laterally through the surface soil. These lateral roots are cut every spring with a long, narrow hoe, and heavy dressings of manure are forked in, so as to furnish a rich and stimulating soil for the encouragement of the growth of numerous small roots from the truncated ends of the main roots. Thus a forced new root growth takes place every season, corresponding with the growth of the vine, and the equilibrium between the roots and branches is constantly maintained. The same mode of cultivation exists in Switzerland and parts of Germany, where many vineyards are planted on the rocky sides of the mountains, which, in some places, are so steep that the soil and manure for covering the roots are carried in baskets up the mountains by men and women. The roots cannot penetrate the rocky subsoil, but spread out in the rich soil above it.

The root growth is different in the West, and that fact may be an additional proof that the damp or compact clay subsoil may cause the rot, as the young vines in this country are generally free from it until the main roots have grown old enough and sufficiently strong *to penetrate the subsoil of clay. Then the disease commences.* If a clay subsoil cannot be avoided or under-drained, then a large, flat stone, buried some eighteen inches below each vine, will prevent the roots from penetrating the subsoil by a downward growth, and will cause them to turn out horizontally and spread through the warm surface soil.

Having provided an elevated location for a vineyard, and guarded against allowing the roots to grow in a cold clay subsoil, there can be no doubt about the vines growing and bearing well, if they are properly pruned and the surface soil kept clean; if all injurious insects are de-

stroyed as soon as they appear on the vines, and suitable fertilizers are properly applied. The vineyard will surely prosper under these favorable conditions, if a judicious care be taken *not to let the vines overbear*.

Having established a well-balanced equilibrium between the roots and branches, and reduced their dimensions by severe pruning, the fruit should be reduced in the same proportion; otherwise, the vine may overbear, and in consequence so exhaust its vitality as to seriously impair the constitutional health of the vine, and bring about a premature decay.

These unstudied remarks are submitted, in the hope that they may induce many persons to continue and persevere in the practice of grape culture in Kentucky, until all the difficulties that are now met with are fully and satisfactorily overcome.

*PEAR CULTURE IN KENTUCKY.

METHOD OF PLANTING AND CULTIVATION—VARIETIES—THE BEST FOR PROFIT.

In order to be a successful cultivator of the pear, much depends on preparing the ground the spring previous to the transplanting of the trees by the cultivation of corn or potatoes on the ground which is intended for the orchard; and before setting out the trees (the preceding fall or spring), the most complete and thorough preparation of the soil is absolutely necessary to insure a profitable return for the labor and expenses incurred. Prepare the ground by deep plowing with a two-horse plow, and a subsoiler following in the same furrow after it. By this means the soil may be stirred to the depth of about fifteen to eighteen inches.

The main point here is to stir the ground deep enough, so in transplanting the trees the loose earth may receive it without digging in the hard clay with a spade, thereby making a hole to retain water, which

*I am indebted for this lucid article upon Pear Culture to one of our best practical fruit-growers and most reliable nurserymen in Kentucky, S. L. Gaar, Esq., of Anchorage, in Jefferson county.

will create an unhealthy action upon the roots and prove detrimental to the tree.

I have planted trees on grass land where I did not wish to plow up the whole field. In this case I staked the rows off at proper distances, say twenty feet for pears and thirty-five for apples. I had the ground thrown up in beds seven feet wide with a two-horse plow, and a subsoiler following in the bottom of the furrow.

This was done in the fall of the year, and in the spring, just before the time to plant the trees, I had the ground re-plowed and thrown back, finishing in the center of each bed in the line where the planting of a row of trees is intended. In this mode of preparation, it is necessary to take advantage of the slope of the ground, so that it will act as drains. All lands should be tile or surface-drained for a pear orchard. If the land is not sufficiently rich to produce a vigorous and healthy growth, mix with the earth where the tree is to be planted two shovels-full of a well decomposed compost, consisting of two fifths stable manure, two fifths leaf mould, and one fifth leached ashes. If the compost is not at hand, take well-rotted barnyard manure, and use it as directed for compost.

The soil being now prepared, and the holes all ready for the reception of the trees, cut off all bruised, broken roots before planting. Let one person hold the tree in an upright position, and another, with a spade or shovel, sift fine top soil among the roots. Tramp the earth lightly around the tree, and be very careful to keep the roots in their natural position, so the earth will be distributed between them, thus separating one from another with intervening soil, so that the young rootlets will strike different strata of earth, and will not come in contact with each other. After the trees are planted, the next work to be done is to prune them.

The question arises, how shall the trees be trained? Some are in favor of open heads, while others are in favor of a pyramidal form. I am decidedly in favor of the latter, not only for the pear, but for all fruit trees. I have had open-headed apple trees totally ruined by the heavy sleet we had four or five years ago—split wide open, in halves and quarters. I have seen the same result from the trees being heavily loaded with fruit; and it is not the case with those that are trained in a pyramidal form. Now and then a limb may be weighted down and break, but not so as to injure the body of the tree. My experience has taught me, in the training of trees, to assist nature in performing its work in the form and growth of the tree.

In order to form a pyramidal tree, cut back the side branches to one half or two thirds of last year's growth, and the main stem or leader should be cut back in the same way; provided, in doing so, it has sufficient advantage over the side branches to insure its leadership, and to have the desired form.

It is very important to cultivate young pear trees well until they get established, say from six to seven years; then they need but little cultivation.

Every few years give them a light top dressing around the trees of ashes and lime mixed together, or barnyard or stable manure. This is very important to keep up the vitality of the tree when it is bearing large crops of fruit each year. The question is often asked, has the cultivation of the pear been profitable? I answer, unquestionably it has been very profitable with some of the varieties. I know from my own experience that I have realized better profits from my pear orchard than any other fruit I have ever cultivated. I have large orchards of apples and peaches, but the yield for profit has not been as great with either, and the apples are more profitable with me than peaches.

I have tested about fifty varieties of pears. Out of that number, I am sorry to say that there are but few varieties that are worthy of general cultivation. I have also about ninety varieties of apple trees now in bearing. They, like the pears, have but few varieties that are profitable for market.

My object in setting out so many varieties was to test their flavor, size, beauty, and bearing qualities, and their adaptation to our soil and climate, and then to cultivate those that prove to be profitable, and discard those that are unworthy of cultivation. I speak of these things to show how important that correct horticultural knowledge should be disseminated throughout the State, in order that the people may be posted up in regard to the most profitable varieties of fruit, and those which are most suitable to our soil and climate, and not depend upon inexperienced and irresponsible tree peddlers to make the selection.

The following is a list of pears I recommend for family use in this State, so far as they have been tried, viz:

Doyenne d'Ete—Rather small; yellow, shaded with red; melting, rich, and excellent; ripens last of June. This is a beautiful little pear.

Bloodgood—Medium size; yellowish, slightly marked with russet; buttery, melting, and rich; ripens 16th July, and is the best of its season.

Tyson—Medium size; yellow, with a red cheek; melting, rich, and delicious; one of the best dessert pears; ripens last July.

Beurre Giffard—Fruit above medium size; yellowish, marked with red next to the sun; ripens middle of July, and is an excellent variety.

Bartlett—Large; yellow; pyriform; frequently a beautiful blush next to the sun; very juicy, buttery, with a rich musky flavor; ripens 10th August; the most popular pear grown.

Buffum—Medium size; yellow, covered with reddish-brown; sweet, buttery, and fine flavor; ripens in September and October.

Bell Lucrative—Medium to large; yellowish-green; slightly russeted; melting, rich, sugary, and highly flavored; ripens in September.

White Doyenne—Medium size; pale yellow, with a faint blush; fine-grained, buttery, melting, rich, and delicious; ripens in September.

Flemish Beauty—Large, beautiful, melting, and rich; ripens in September.

Seckel—Small; yellowish-brown, with red cheek; sweet, spicy, very rich, and delicious; considered the standard of excellence; ripens in September.

Sheldon—Above medium size; round; greenish-russet, sometimes tinted with red; melting, juicy, and delicious; ripens in September.

Lawrence—Large; greenish-yellow; melting, sugary, with a rich aromatic flavor; ripens in October to January, and is one of the best late pears.

I will now give a list of pears which I conceive the most profitable for market purposes, viz:

Chambers—Medium to large; the skin is a rich golden yellow, thickly covered with grey dots, and, next to the sun, has a beautiful bright red cheek. Ripens the 5th of July. This pear is a long time coming into bearing. It should be grafted on old trees to make it more early in fruiting. It commands the highest price of all early pears.

Bartlett—Is the most profitable variety of pear in cultivation. It is the fruit for the million. It is adapted to all soils and every climate, and can be cultivated in every State in the Union. It gives general satisfaction in Europe and in America. It was originated in Berkshire, England, about the year 1770, and imported by Enoch Bartlett, of Dorchester, Massachusetts, who had lost the name under which it was originally imported. It is best known in England by the name of "*Williams' Bon Christian*." This noble and popular variety every year is growing more and more in favor with fruit-growers throughout our land.

Lawrence—Is a fine early winter pear, that brings good prices in the market; a variety of great excellence.

Beurre d'Anjou—Large; greenish-russet, with a dull red cheek; buttery and melting; this promises to be profitable for market; ripens in October.

Clapp's Favorite—Is of great promise.

We have other varieties that are worthy of cultivation, if they did not yield so readily to the blight.

ASYLUMS AND ELEEMOSYNARY INSTITUTIONS.

Nothing more thoroughly illustrates the civilization of a people than the care with which they provide for the welfare of those unfortunate members of society who are deprived of their reason or mental faculties—their hearing, eye-sight, or power of speech. It is a proud distinction which Kentucky holds among her sister States, that she now maintains, at public expense, three lunatic asylums, which have been pronounced by competent experts to be the *best provided*, and probably the *most ably conducted*, institutions of the kind in the world. These are called the First Kentucky Lunatic Asylum, the Second Kentucky Lunatic Asylum, and the Central Kentucky Lunatic Asylum.

The FIRST is located at Lexington, and is under the management of R. C. Chenault, M. D., an able, accomplished, and efficient physician, who has as much practical experience in the management of the unfortunate class of lunatics and idiots as any man in America. There are at this institution usually from 550 to 600 patients. The buildings and all appurtenances are first-class for the uses intended.

The SECOND is located near Hopkinsville, and is probably the best constructed and best appointed asylum in the United States. James Rodman, M. D., one of the ablest and most successful physicians in the State, has the management of the patients, who number usually from 400 to 500. The reputation of Dr. Rodman as physician, surgeon, and manager of this institution, has become national, and competent experts place the management and success of the Second Kentucky Lunatic Asylum abreast of any other in the world.

The CENTRAL Asylum is located near Anchorage, in Jefferson county, and is under the able management of C. C. Forbes, M. D., who has

proved himself equal to any physician in the West in the successful treatment of patients, and in his superior executive abilities for the discharge of the multiplied duties of his position. The buildings are well suited for the purposes intended, and every convenience and comfort which it is possible to give the unfortunate lunatics are here afforded them. The CENTRAL has usually from 300 to 400 patients.

The State Institution for the Deaf and Dumb is located at Danville. It is under the charge of J. A. Jacobs, who thoroughly understands the best method of instructing the deaf mutes, who are here educated at the expense of the Commonwealth. Every deaf and dumb person in the State, of sound mind and body, is privileged to receive all the benefits of this institution, without charge for board or tuition, for a term of seven years.

The State Institution for the Blind is located at Louisville. It is under the management of Prof. H. B. Huntoon, who has proved himself well suited to the position of instructor of the blind pupils. Any child from six to sixteen years of age, of good health and sound mind, whose eyesight is so defective that it cannot learn at an ordinary school, is admitted into this institution and receives an education at the expense of the State. The students are taught to read, write, and do various kinds of work. The American Printing House for the Blind is connected with this institution, which is supported by this and other States.

The State Feeble-Minded Institute is located near Frankfort, upon beautiful grounds, which are highly improved. The manager, Dr. E. H. Black, is a thorough scholar, and has made a specialty of teaching, until he has few, if any, superiors in the United States employed in similar institutions. Feeble-minded children from six to eighteen years of age, from any part of the State, can here be instructed as in other schools, free of charge, for a period not exceeding ten years. Calisthenic exercises are added to the routine of studies, so as to amuse and instruct, and at the same time promote good health among the pupils.

Private Charity Schools exist in several of the cities and towns in the State. These are usually attached to some religious society or social fraternity. Probably the most prominent of these is the "Masonic Widows' and Orphans' Home," at Louisville. This is, in many respects, the largest and best provided institution of the kind in America. Here are educated, at the expense of the Grand Lodge of Masons of Kentucky, the indigent orphans of Master Masons, and a home given to the widows of such Masons as have died in poverty.

* CISTERNs—THEIR USES AND METHODS OF CONSTRUCTION.

The past season, like many previous, has developed the fact that, in certain localities in the State, some artificial means must be adopted to insure a supply of water for drinking and culinary purposes, as well as for stock.

There are very few farms in those parts of the State where scarcity of water is of such frequent occurrence, on which there is not a sufficient number of houses from which rain-water may be gathered in such abundance as will relieve the people from annoyance and inconvenience. It is presumable that the reason why such facilities have not been heretofore provided, is not so much because of the want of means as it is a want of information as to the possibility of procuring an abundant quantity of the best water for all purposes; and to this end it may be advantageous to direct to this subject the attention of the people, and give some information on the subject.

The fact has been established by the Signal Service Bureau of the Government, that there is in Kentucky an average annual water-fall of 48.43 inches, as per table as follows:

MONTHLY AND ANNUAL RAIN-FALL (INCHES) LOUISVILLE, KENTUCKY.

Average annual rain-fall, 48.43 inches (5 years).

MONTH.	1872.	1873.	1874.	1875.	1876.	1877.
January.	*4.65	2.93	2.39	2.42	11.63	3.95
February.	*3.20	5.42	5.18	2.09	2.92	.44
March.	1.41	3.39	6.63	4.54	6.01	4.93
April.	8.40	3.05	6.01	.87	4.50	5.31
May.	4.49	5.73	1.17	4.07	1.00	3.98
June.	6.19	3.87	2.95	5.79	6.52	5.57
July.	3.67	3.43	2.71	16.46	3.61	4.19
August.	2.45	3.04	3.23	2.19	4.29	2.70
September.	4.41	2.50	.62	1.05	2.66	3.02
October.	3.92	3.26	2.04	1.92	7.61	1.81
November.	.56	2.19	5.90	6.14	1.63	
December.	2.58	6.99	4.77	5.67	1.24	
Total.	†45.93	45.80	43.60	53.21	53.62	

* No record of amount, but this is about the average for January and February.

† Record incomplete.

FERRY E. SEBREE, *Observer.*

SIGNAL OFFICE, LOUISVILLE, KY., Nov. 19, 1877.

* I am indebted for this very able, lucid, and practical article to Major PHILIP SPEED, of Louisville.

Of this it may be safely estimated that 30 to 35 inches may be saved in cisterns. It may be relied upon, also, that a fall of 30 inches will produce 40 barrels, of 40 gallons each, for every 10 square feet of roof. The calculation may, therefore, be readily made how large a cistern must be made so as to save the water from any house or roof. The calculation can be readily made as to the capacity of roofs and cisterns for supplying water for household purposes, as well as for stock; and for this calculation it is safe to estimate 10 gallons per day for each person, and 5 gallons per day for each animal.

To arrive at the size of a cistern to hold a desired quantity of water, the following table is appended:

CAPACITY OF CISTERNS IN U. S. GALLONS FOR EACH TEN INCHES IN DEPTH.

2 feet in diameter.	19 gallons.	10 feet in diameter	489 gallons.
3 " " " "	44 "	11 " " " "	592 "
4 " " " "	78 "	12 " " " "	705 "
5 " " " "	122 "	13 " " " "	827 "
6 " " " "	176 "	14 " " " "	960 "
7 " " " "	240 "	15 " " " "	1,102 "
8 " " " "	314 "	20 " " " "	1,958 "
9 " " " "	397 "	25 " " " "	3,060 "

This table is sufficiently accurate for all practical purposes.

As to the construction of cisterns under ground, it is always best to have them as deep as possible (that is to say, from 10 feet to 20 feet), and especially is this the case for those intended for drinking purposes. It is always best to have cisterns walled around with brick or stone on which to plaster. The thickness of the wall should depend in a great measure upon the size of the cistern as well as its location. For ordinary cisterns, a four-inch brick wall, laid close against the bank, is all sufficient; if stone is used, a thicker wall will be more easily built. If a cistern is built on a hill-side, there will always be a pressure from the water accumulated in the earth on the upper side. To resist the pressure of this accumulated water, the wall on the side exposed to it should be laid in mortar made with hydraulic cement, and the plastering put on of sufficient thickness to withstand it. Many cisterns have been in use for years where the plastering was laid upon the clay. Such a construction, however, will not always stand the outside pressure from accumulated water, either on a hillside or within marshy localities.

The location of the cistern, as well as the kind of earth to be met with, should determine as to the use of the wall or plastering on the earth. Whether the cistern is built with or without the wall, there should be two or three good coats of plastering, composed of two parts of sharp sand to one of the best hydraulic cement. These materials, in this proportion, should be mixed together very thoroughly before any

water is added, and only so much of it made into mortar at one time as can be used in ten to fifteen minutes; for if it is allowed to stand as mortar, it "sets" as soon as it begins to harden, so that then it cannot be safely relied upon. In all cases when walls are used it is better to lay the material, whether it be bricks or stone, in hydraulic cement mortar, as such a wall will more effectually protect the cistern from the outside pressure of water and the roots of trees and weeds, which in many instances run a very great distance seeking dampness. In this connection, it is regarded as unwise to allow trees to grow too near the cisterns, especially the locust, silver-leaf poplar, alenanthus, &c.

The plastering of cisterns is by no means as difficult a job as might be supposed, since the work does not require the same polish and accurate finish that is necessary in housework. Indeed, the whole work, digging, lining, and plastering, may be done for the most part by ordinary farm hands who have any mechanical aptness. The only difficult part of the job is the top, which should be built of brick, and drawn in or arched, so as to leave an opening of two feet square. This arch or top should be laid in mortar made with hydraulic cement, so as to bind it together as a solid mass.

In localities where a sufficient depth cannot be readily attained, the cistern may be brought up above the surface of the ground, so as to utilize the earth thrown out. In such cases, the earth should be sufficiently thick over the arch to enable grass to grow on the mound, as it should be sodded when finished.

All cisterns should be closely covered, not only to keep out worms and other reptiles, but also to exclude sunlight, which, by its action on the water, generates what is generally known as "wiggle-tails."

The convenience of cistern water for all household purposes is so apparent that it seems useless to say anything. But the improvements lately made in the construction of force pumps render it perfectly practicable for every country housekeeper to have bath-rooms and water-closets as complete as the most elegant city mansions. This is done by having a tank in the attic or garret, which is filled with very little labor from the cistern, and may be conveyed not only to the bath-room but to every room in the house.

As to the healthfulness of cistern water, the following extract from a letter of Prof. T. S. Bell, of Louisville, contains many valuable suggestions:

"Neither river, spring, nor well water can be relied upon for purity. By far the best resource for this essential to comfort, enjoyment, and

health is rain-water, properly collected and judiciously housed in ample cisterns well constructed. The best drinking-water in this city is from a cistern on a piece of property belonging to Richard Coxe, Esq. It is on Grayson street, near Seventh street. Mr. Coxe constructed the cistern for the use of his family. During the forty years that the late Professor Dudley resided within the city of Lexington, he would not use any water for drinking and cooking but rain-water. After the great cholera endemic in 1833, at Lexington, numbers of persons abandoned the limestone water, and have used the rain-water since that time. It is not only the most healthful water that can be used as a drink, but far, very far superior to limestone water for all culinary purposes requiring water. Asparagus, beets, cabbage, peas, hominy, green corn, and every thing of that kind, that are cooked in pure rain-water, not only taste more pleasantly than those cooked in limestone water, but are more easily digested.

“In this important matter it is essential not to be governed by names. It does not follow, that because we have rain-water it is necessarily pure. Rain-water is likely to be free from many impurities, yet it may in its descent imbibe many. Rain-water collected from good roofs in country places is necessarily free from many impurities that will be found in that gathered in cities, especially in the immediate vicinity of manufacturing establishments that consume large amounts of bituminous coal. Rain-water should not be gathered without the exercise of a well-informed judgment. That which first falls on the roof should not run into the cistern. It should wash the atmosphere and the roof thoroughly, and, after that is accomplished, ‘the latter rain’ may be stored in the cistern. If that is properly made, such rain-water as I have described as fitted for storage may be regarded as a priceless treasure. The ideal pure water does not exist in nature, nor can chemistry relieve water of all its impurities. What is justly called Clark’s process for purifying water is by far the most perfect that is known for use on a large scale; but even it leaves some lime in the water. Thus, if a gallon of water contains $17\frac{1}{2}$ grains of lime, Clark’s process can remove 16 grains of the lime, but cannot disturb the remaining $1\frac{1}{2}$ grains; they seem to be fixed. It is estimated that if Clark’s process were applied to the water-supply of London, fifty tons of impurity would be precipitated daily. That which removes the chalk or lime defilement removes a great many organic impurities also from water. Even in calico-printing the value of softened pure water is so great, that in many establishments expensive works are built for purifying the water.

"In securing the delivery of comparatively pure rain-water into cisterns, and in drawing it for use, all lead material should be avoided. Pure water acts upon lead more rapidly and with more energy than impure water.

"Any housewife may satisfy herself of the great value of pure water in culinary operations by a few experiments. If she takes distilled water, or pure rain-water, for one tea-pot, and spring or hard water for another, and places precisely the same amount of tea in each vessel, she will find that which is made with pure water not only better flavored but much stronger than the tea made with water containing lime and salts. The same principle holds good in other culinary operations. Water that coats the inside of a vessel with lime or other impurities will deposit these defilements in the vegetables and meats cooked in it. Physiology holds that water is the mother of life, as it assuredly is; but science is trumpet-tongued in teaching that the *impurities* of water are the parents of numerous diseases that inflict suffering and tend to death. A perfectly accurate test as to whether water is pure or not, and which anybody can use, is found in a solution of per-manganate of potash. One drop of a saturated solution, made in distilled water, will give a pink color to ten fluid ounces of distilled water. But the presence of any organic matter in water prevents this pink color as the product of a single drop of the dissolved per-manganate of potash, and the relative amount of impurity in different waters is shown in the relative amount of the solution required to produce the pinkish hue. Thus, Dr. Hammond found that four drops of the solution were required to give a pink color to ten ounces of the water conveyed to Washington City by the aqueduct; eighteen to produce the same result in ten ounces of water obtained from a marsh near the city, and twenty-seven to ten ounces of the water of the canal that flows through the city. The saturated solution of per-manganate of potash may be regarded as an infallible test of the purity of water.

"One thing should be impressed upon every mind. Pure water is essential to good health, and to other comforts and conveniences. Another truth should never be forgotten nor neglected. Water that is unsuitable for drinking, through its want of purity, is utterly unfitted for any culinary purposes."

In addition to the opinion of Dr. Bell, it is said that the United States Medical Association, at one of their annual conventions within the past few years, commended the use of cistern water as preventive against cholera, as well as other diseases engendered in malarious districts.

Fortunately for Kentucky, the material for making good cisterns (hydraulic cement) is as abundant, cheap, and as good as any to be found in the world.

*THE CITY OF LOUISVILLE.

Louisville, founded in the year 1778, incorporated as a city in 1828, and entitled to the honors and joy of its centennial this year, is ranging as the 14th city as to size in the United States; it is the largest city in the State of Kentucky, the commercial and industrial metropolis and railroad centre of the State, and has undoubtedly a grand future. Geographically speaking, it is very favorably situated in latitude $38^{\circ} 3'$ north, and longitude $85^{\circ} 30'$ west from Greenwich, on the left or south bank of the Ohio river, in the centre of the great and rich Southwest, between the cotton-growing South and the grain-fields and meadows of the North and West—in the very midst of the States and Territories opened to civilization in this country up to this day. Topographically, the city offers many advantages. Situated on a plateau about 70 feet above the normal state of the Ohio river, and from 20 to 25 feet above the highest flood mark, opposite the well known Falls of the Ohio, it possesses a river front of 8 miles or more, suitable for wharf purposes; and also vast level grounds extending for four miles west to the Ohio river, which is bending there and running due south, and for many miles south to and beyond a range of hills called the "Kentucky Knobs," while very extensive tracts of high and rolling land in the eastern, north-eastern, and southeastern direction afford fresh and cool air, picturesque scenery, and fine and distant views; it has practically unlimited suitable space for building private and business houses, factories, foundries, mills, etc., and offers great inducements for the establishment of gardens and dairies. The Ohio river bridge connects Louisville commercially and socially with Jeffersonville and New Albany, two cities on the right or north bank of the Ohio, in the State of Indiana. The climate of Louisville is temperate, genial, and salubrious, though at times subject to sudden changes. To judge by the mortuary lists the city is one of the healthiest in the world.

Temperature of Louisville.—According to the reports of the United States Signal Officer about the state of the atmosphere and temperature at his station in this city, quite a distance from the ground, and not far from the Ohio river, the thermometer showed, as maximum heat in the

* For this lucid article on the city of Louisville I am under obligations to Mr. Charles L. Franke, of that city. Mr. F. is one of the best and most reliable statistical writers of the West, and being himself a highly educated German, understands well how to compare Louisville with other cities.

shade in the summer (July) of 1876, 95° , 96° Fahrenheit ($95 - 32 = 63 \div \frac{1}{9} = 28^{\circ}$ Reaumer), while at druggists' stores, near the earth's surface, a higher temperature, up to 100° , was observed. In the course of the last fifteen years the mercury has not reached 90° in six years, and exceeded 100° by one or two degrees only in four years. Neither do the people in Kentucky suffer much by the extreme rigor of the winter of the more northern latitudes of America and Europe. The mercury usually keeps 5° to 20° above zero—Fahrenheit freezing point 30° above zero—and rarely falls below zero down to 5° or more below zero ($5 + 32 = 37 \div \frac{1}{9} = 16\frac{1}{3}^{\circ}$ Reaumer). The cold weather usually lasts only a few days in succession, and in some winters does not form ice of sufficient thickness to be fit for home consumption. This does not, however, exclude the fact that there were some extremely cold days and series of days in parts of Kentucky (and Tennessee) in past seasons. according to reminiscences of Dr. L. P. Yandell, sr., and Dr. T. S. Bell, of Louisville, as reported in the Louisville Courier Journal—

In the years 1817-'18 the Ohio and Cumberland rivers were frozen over.

December, 1830, the mercury stood at zero in Nashville, Tennessee.

Winter 1831, the mercury stood 26° below zero in McMinnville, Tennessee.

November 25, 1831, commenced 6 weeks cold weather.

February 7, 1835, 13° below zero in Lexington, Kentucky.

February 8, 1835, 20° below zero in Lexington, Kentucky.

February 22, 1837, 3° below zero; Ohio frozen over from February 2d till March 2d.

March 21, 1843, 3° below zero in Murfreesboro, Tennessee.

Same day 9° above zero in Louisville, Kentucky.

About middle of January, 1852, 26° below zero—unprecedented in Louisville; killed peach trees and blackberry bushes.

December, 1855, 6° below zero in Louisville.

January, 1856, 21° and 22° below zero in Louisville—two cold days in succession; killed blackberry bushes.

January, 1856, 4° below zero in Louisville.

January, 1862, 15° below zero in Louisville.

January, 1877, 15° below zero in Louisville.

Sanitary Condition of Louisville.—Sanitary condition of the city, as shown by the annual report of the Health Officer, Louisville, Kentucky, January 19th, 1876, for the year 1875:

Total number of deaths, 2,580, against 2,476 in 1874—including 15 deaths from small-pox, and 93 deaths from scarlet fever. *Sex*—male, 1,317; female, 1,263. *Color*—white, 1,927; black, 653. *Nativity*—native, 2,080; foreign and unknown, 500. *Ages*—under 1 year, 805; 1 to 2 years, 213, etc., against 835 and 207 respectively. Besides, without medical attention, 108. Total, 2,688, against 2,816 in 1874. Estimated population, 150,000. Mortality death-rate per 1,000 about 18. The death-rate of Louisville is as small as that of any other city in this country, and probably in Europe, in proportion to the number of inhabitants. The comparative small mortality and good health of the city is due to her topography affording good surface-drainage, and to the Ohio river, a rapid stream, conducting the refuse material from the city's front; to our favorable geographical position, our temperate climate, good drinking (well, cistern, and river) water, generally speaking judicious way of building, regular wide streets, laid out at right-angles, and a great many spacious, wide, and deep lots, affording sufficient breathing-room; to good drainage by a fair system of sewerage, to be further extended and improved (our present sewers amounting to 29.42 miles); to the general cleanliness of the streets, and to the ability and efficiency of our Board of Health, limited, as its power yet is, in preventing and circumscribing epidemic diseases—cholera, small pox, scarlet fever, etc.

Description, etc.—The streets are laid out by the meridian due north and south, east and west, and in straight lines, with but few exceptions, mostly 60 feet wide, and some 80, 90, and 120 feet. There are 376 streets, aggregating $119\frac{1}{4}$ miles (English), and — alleys, aggregating $22\frac{1}{2}$ miles, and about 25,000 houses. The houses are built upon an area divided off into about 1,300 squares, covering a space of about 18 square miles. Street car horse railroads run on the principal streets, connect all parts of the suburbs with the central and business portion of the city—fare for any distance 5 cents a person. The cost of a lot in the suburbs, of say 30x100 feet, and cottage, frame or brick, of four rooms, sufficiently capacious to accommodate a small family, ready for occupancy, is, at present low prices, about \$700 to \$1,200. There is of course great diversity in the value of lots, according to location, surroundings, and size, as well as in the dimensions, style, and price of buildings, some pieces of property costing as high as \$100,000.

The population of Louisville was, according to the United States census of 1860, 68,033, and of 1870, 100,753. It is estimated at present, on the basis of seven to a voter, at 140,000 (the total vote for city mayor at the election on December 6, 1875, 3 candidates, being 20,834), and

on the basis of 41,625 names in the city directory for 1875 multiplied by $3\frac{1}{2}$, 145,687, and multiplied by 4, 166,500; and of 44,562 names in the directory for 1876, at the low ratio of $3\frac{1}{2}$ population to every name, a population is given of 155,967, or, in round numbers, 156,000; and of 45,564 names in the directory for 1877, at same ratio, a population of 159,474, in round numbers 160,000.

Real estate transfers recorded in county court and published in the newspapers amounted, in 1874, to \$5,619,240; in 1875 to \$6,145,527, and in 1876 to \$3,189,953—a great falling off, owing to the hard times. The total of buildings erected in Louisville in 1874 was 107.9, at a cost of \$1,902,102, original estimate; actual cost, considerably more.

The value of taxable property (real estate) in 1874	\$78,295,115
The city taxes for all municipal purposes were	\$1,552,244
United States internal revenue from tobacco, whisky, &c., 1876, was . .	\$3,189,716
The number of industrial establishments, foundries, factories, mills, &c., in 1874, was	648
Capital invested in these	\$22,500,000
Number of laborers in same.	16,600
Amount of wages paid	\$8,475,000
Annual manufactured products	\$59,725,000
Annual imports about.	\$150,000,000
Annual exports about.	\$125,000,000

There were included among these establishments, iron mills, large foundries, gas and water pipe factories, agricultural implement factories, and works for making machinery of all kinds, for furniture, tobacco stemmeries, and factories of all kinds, tanneries, hemp, flax, cotton, jute, and woolen mills, steamboat building, &c., &c.

Louisville has the largest iron works in the Southwest, and the cheapest iron, gas, and water-pipe market in the West. From the Kentucky Bell Foundry, of this city, originates the best cow bells in the world. More good plows are made here than at any other place in the United States; the Louisville Plate Glass Factory is found the best for the finest mirrors, and Louisville and New Albany, Indiana, have the only plate glass factories in the Union, and also the largest hydraulic cement market in the Mississippi valley. The tannery business is here conducted on a scale of wonderful extent, and a system has been invented whereby the tan-bark, after it has been used in the tanneries, can be utilized to great advantage as fuel. The above tables, taken for 1874, are the latest to which we have access at this time, but the value of real estate and other things keep pace with the increase of population.

Transportation Facilities.—We have the beautiful Ohio river, with its numerous connections with all parts of the Mississippi Valley, so perfect that our steamboats can reach every part of the West and South at all seasons of the year. Being a port of entry, goods of all kinds are

received here directly from European points, just as they are in New York and other sea-board cities.

Besides the Ohio river, we have the Louisville, Nashville and Great Southern Railroad, with its branches and connections, the Louisville, Paducah and Southwestern Railroad, the Louisville, Cincinnati and Lexington Railroad, "Short-line," connecting through the Ohio river bridge with the whole railroad system east, north, northwest, and west, and bringing near to us all sections of the country.

We confidently expect also that the building and completion of the Lexington and Big Sandy Railroad *via* Mount Sterling, Owingsville, and Catlettsburg, to give us a short and cheap through route to the Atlantic *via* the Chesapeake and Ohio Railroad, the extension of the Lebanon Branch *via* Knoxville (or Cumberland Gap) for the purpose of a connection with the Virginia railroad system, East Tennessee and Virginia Railroad, Virginia and Tennessee Railroad, Petersburg and Lynchburg Railroad, Norfolk and Petersburg Railroad, Richmond and Danville Railroad, said East Tennessee and Virginia Railroad to be extended to any of above said points, also with the North Carolina, South Carolina, and Georgia railroad system, the completion of the Louisville, New Albany and St. Louis Air-line Railroad, further extension of the Louisville and Harrod's Creek Narrow-gauge Railroad, and other enterprises of this kind, of great direct and indirect advantage to the city and State will follow, in the work of gradually returning public confidence and general prosperity.

Miscellaneous.—We have a Tobacco Board of Trade, a Tanners' Board, a Furniture Exchange, and a Mechanics and Manufacturers' Exchange, an association of business men formed for the purpose of promoting the manufacturing and mechanical interests of Louisville, and to remove impediments to the progress and prosperity of the city. Under the auspices of the Exchange, a weekly paper, the "Manufacturers and Merchants' Advertiser," is published in this city. We possess a large and fine "Exposition Hall," a "Public Library of Kentucky," with museum and art gallery, the grand and imposing structure, the Ohio river bridge, the Louisville and Portland Canal, and the Water works, Gas-works, and 75 miles street-car railroad system, all in successful operation. There are in the city many responsible home fire insurance companies, and agencies of foreign fire, marine, and life insurance companies; also agencies of all the express companies. Our fire department, in its outfit, organization, and efficiency, has no superior in this country, and probably nowhere in the world.

Our hotel accommodations, as offered by the Galt House, Louisville Hotel, Willard Hotel, Fifth Avenue Hotel, Rufer's Hotel (European plan), Waverley Hotel, are unsurpassed in the West. Good hotels are also the St. Cloud, Merchants', Alexander's, Riverside, Kelley's, and others. The ground, tracks, and appointments of the Louisville Jockey Club and Driving Park Association, organized in the spring of 1875, are perfect, and their semi-annual races, in May and September, so far proved complete successes. The "Central Park" (private property), comprising some seventeen acres, and the "Floral Park" are the chosen places for promenade concerts, picnics, etc., and our theater and concert halls answer well their purpose. We have quite a number of fine market-houses, hundreds of large and substantial factory, foundry, and business buildings, and thousands of well-constructed, comfortable, and elegant private residences, erected on wide and deep lots, and surrounded by shade and ornamental trees, shrubs, and flowers.

The "Masonic Widows' and Orphans' Home," other asylums and hospitals, as well as halls of various social and benevolent societies, Masonic Temple, Liederkranz Hall, are worthy of note. Several of the 101 churches, capable of seating 50,000 persons, and embracing all the leading religious denominations and creeds, are not less admired. "Cave Hill" is by nature and art one of the most beautiful cemeteries in the whole country. The "St. Louis Cemetery" (Catholic) has likewise a good location and fine topographical features.

Schools and Colleges.—Louisville has a good system of free schools and education: 28 public schools buildings, including two high schools, one for boys and one for girls, one training school and four schools for colored children, the property representing a cost value of nearly \$1,000,000, and the annual expenses for teachers and maintenance of schools amount to about \$300,000. There were enrolled in 1875 17,557 pupils, with an average attendance of 12,325, enrolled in 1876 nearly 18,000. Night schools are established for the benefit of the hard-working and poor youth who cannot afford to attend any day school. Besides, there are in Louisville three medical, one law, and a number of private and denominational schools. At the medical schools we find about seven hundred students from all parts of the country. Additional public school buildings will have to be erected soon. The education of the colored population has been and will further be liberally provided for. Other public buildings and institutions are the Court-house, with Hart's statue of Henry Clay in the rotunda, the City Hall, the Alms-house (new), the Louisville Marine Hospital, the Pest house or Eruptive Hospital (new), not used for the original purpose, and proposed by the Mayor to serve as an Inebriate Hospital or as an Insane Asylum, if practicable, the Institution for the Blind, and the United States Marine Hospital, the Jail, four Police Station Houses, three Houses of Refuge—one for white boys, one for white girls, and one for colored children (the latter now in the course of erection), the Work-house, Custom-house, Post-office, &c., &c.

Of the twenty-three newspapers published in Louisville, six are political dailies—four in the English and two in the German language.

Louisville was selected, in 1875, to be the headquarters and emporium of the National Grange—due to its favorable geographical position and

central location, with many railway facilities—as the best point for the distribution of the products of the soil, mines, and manufactures of and in the United States; also as the headquarters of the American Co-operative Union and the Mississippi Valley Trading Company.

City Government.—As regards the city government, I will say only, that the government of Louisville, like that of the other cities in this country, is composed of a mayor, who is the chief executive officer, and a general council, the legislative body, composed of the board of aldermen and of the common council. The laws and ordinances are well administered, and the life, liberty, and property of citizens fully protected.

A four hours' ride on the Louisville, Nashville and Great Southern Railroad to Cave City, Barren county—distance from Louisville 90 miles (English)—and a two hours' stage ride from that point—distance 10 miles—carry persons, residents and travelers, touching Louisville, to one of the greatest sights and natural curiosities in this country, sharing its honors bestowed by natives and foreigners with the world-renowned Niagara Falls, the most marvelous and sublime handiwork of nature, the MAMMOTH CAVE, situated in Edmonson county, Kentucky, near the Green river; in depth, width, and height one of the most extensive and remarkable caves in the world, and, on account of its strikingly curious formation of rocks, stalactites and stalagmites, elevated and grand domes, wonderful echoes, waters running deep and still with sightless fish, "bottomless" pits, and even, moderate temperature of about 60° Fahrenheit at all seasons of the year, etc., of great interest and attraction for men of science, tourists, and excursionists.

The Mammoth Cave is visited on an average by about 3,000 persons, from nearly all parts of the globe, every year, usually stopping at the well managed "Cave Hotel," that furnishes old, experienced, and reliable guides for the so-called "long route" and "short route" in the cave, which require together about 10 hours' time to make.

The railroad bridge which spans the falls of the Ohio river at Louisville is one of the most substantial, one of the longest, finest, and most sightly structures of the kind in the world. It is but little short of one mile in length, and affords a perfectly safe transit for the most heavily freighted trains to pass over at one of the most romantic spots on the beautiful Ohio.

Did space permit, I would like to give other statistics, and point out the natural advantages possessed by Louisville, which will in the close future make it a leading commercial and manufacturing centre among the large cities of the United States. But, suffice it to say, that at present no other point in the Mississippi Valley presents to capitalists, manufacturers, and laborers a better locality or one more favored by nature, either for business or residence, than this city; and when the great water-power of the Ohio river falls is utilized, in addition to the coal and abundance of mineral ores and other raw materials lying contiguous to this point, there will be an impetus given to the manufacturing industries of every class that will soon make Louisville and the towns around the falls occupy the same position to the great Mississippi Valley that Manchester and Birmingham now do to the British Islands.

ADAIR COUNTY.

Adair was formerly a part of Green county, from which it was taken in 1801, and named in honor of Gov. John Adair. It is situated in the middle-central portion of the State, and bounded on the north by Green and Taylor counties, east by Casey and Russell, south by Cumberland, and west by Metcalfe and Green.

The geological formation is almost exclusively sub-carboniferous. The central series of this formation covers about one half of the county, which is characterized by a rich colored red clay underlying the top soil. Dry Fork, Cedar, and Glenn's Fork show in their beds the shaly, geodiferous limestone of the lower division of the sub-carboniferous limestone. Where this shaly limestone prevails the land is apt to be glady, with a subsoil more yellow or whitish, and less productive than the red clay subsoil. A compact, grey, sub-crystalline limestone, mixed with cherty clay stones, appears in the bed of Russell creek, with a dip towards the southwest, and which underlies the shaly limestone, and disappears with it under the cavernous limestone in the western portions of the county. Below this formation is the black lingula shale or slaty formation, and the Waverly silicious sandstone, that outcrops in parts of the eastern portion of the county. The soil made by the disintegration of this formation is usually too retentive of water, and is apt to be "spongy or crawfish land."

The only ore to be found in this county is probably iron, intermixed with the red clays, but not in quantities sufficient for profitable working.

The face of the country is general hilly, though a plateau of level land lies between Russell creek and Green river, and also in other parts of the county. The soil is generally second-rate compared with the best grades in some of the other counties of the State. This soil, however, is susceptible of great improvement by the addition of gypsum or land plaster, lime, ashes, salt, in quantities of about one to two bushels to the acre, and marls, particularly the German kainit, or South Carolina marls and nodules, in order to overcome the tendency of sourness, caused by an excess of nitric acid in the land, as is evidenced by the growth of sorrel, pennyroyal, sourwood, dogwood, black gum, &c.

Streams.—The principal rivers are the Green river and Russell creek, with their tributaries, White Oak, Case's, Pettus, Glenn, Sulphur, Harrod's, Crocus, Big creek, and the East Fork of Little Barren.

Agriculture.—Wheat, corn, oats, rye, flax, tobacco, millet, orchard grass, red-top, and timothy all do well, particularly on the creek bottoms and lands with red clay subsoils. Fruits of all kinds flourish, and the eastern and southern exposures of the hills are well adapted to grape-vines, which grow wild in large numbers. With proper care and knowledge, much excellent wine could be profitably made, and large quantities of dried fruits and brandies could be produced every year.

TOWNS AND VILLAGES.

Columbia, the county seat, is pleasantly located in the middle of the county, on the south side of Russell creek, and has a population of some five to six hundred persons, a good brick court-house, six churches, good school-houses, and other public buildings and institutions usually found in a town of that size.

Neatsville is a very pretty village, of about fifty inhabitants, situated fourteen miles northwest from the county seat.

Milltown, a small town of one hundred population, lies southwest from Columbia; is surrounded by a neighborhood of good lands; and *Glenfork*, about the same size, lies southeast of Columbia, at a distance of about eight miles.

Education—At Columbia there are two flourishing academies (male and female), under the charge of able and efficient professors and teachers. There are, in this county, the usual number of public school districts, in each of which a school is taught under the State system during the year, thereby affording an opportunity to every child in the county to obtain a good common school education.

Domestic Arts.—The smaller industries belonging to farm economy receive some attention in this county, but not as much as their importance demands. Milk, butter, eggs, chickens, geese, turkeys, and ducks are produced in quantities sufficient for the wants of the inhabitants, with but a small surplus for outside markets. Household manufacture, or the domestic arts, are less attended to than formerly, when every house had its loom, and every man and boy wore "home-made clothes," and linsey and jeans stood high in the estimation of the people.

Commerce and Trade.—Adair county lacks the facilities for commerce that is enjoyed by some of her neighboring counties, but she has the

promise of a railroad, the "Ohio and Cumberland," which will no doubt be of great benefit whenever it is completed. Good mills, and some wool-carding factories, are located in the county, but no very great development of manufactures from wood, or from the large surplus of soil productions which the county can boast, have as yet been made.

The Future.—The agricultural and fruit interests are improving, and many new orchards are being planted, and some fine breeds of stock being introduced; but as yet the scrub stock of all kinds have the run of the country and are more common. This county is well adapted to sheep-raising, and can, if the choice breeds are introduced, be made to produce as fine wool as any in America. Should coal oil be discovered, which is highly probable from the geological formation of the county, it will add greatly to the natural resources of the county, as it has done to the adjoining county of Cumberland. For statistics, value of lands, &c., of this and other counties, see index.

ALLEN COUNTY.

Allen county, named for Col. John Allen, who was killed in the disastrous battle of the river Raisin, was formed in January, 1815, out of portions of Warren and Barren counties, and is situated in the central southern portion of the State, immediately on the Tennessee border. It is bounded on the north by Warren and Barren counties, on the east by Barren and Monroe, on the south by the State of Tennessee, and on the west by Simpson and Warren counties. Nearly all of this county is located on the sub-carboniferous limestone formation, the black lingular shale coming to the surface in some of the northern parts of the county. This shale is relatively thin, and the slaty formation is overlaid with about 100 feet of encrinital and shaly limestone, which in turn underlies, in most of the county, the thick stratified grey limestone or bluff rock of the St. Louis or Lithostrotion bed.

The face of the country is somewhat broken, though much level land is found on the various plateaux between the different creeks and rivers. Along the northern portion of the county salt wells have been bored,

and one near Port Oliver was formerly worked quite profitably; but of late years this industry has been neglected, although the salt water is plenty and strong. There is doubtless much coal oil in the parts of this county similar in geological formation to the oil region of Barren and the adjacent counties. Several fine sulphur springs and wells have also been found in Allen county, though as yet none of them have become places of resort, owing, not to the inferiority of the waters, which are excellent, but to the want of facilities of travel. Some iron ore (evidently of aqueous formation) is found mixed with the red clays and cherty beds overlying the grey limestones, but probably not in quantities sufficient for profitable working.

Soil and Crops.—Like other counties underlaid by the sub-carboniferous strata of limestone, Allen has much very rich, productive lands, with some inclined to be too wet or slashy, that could be greatly benefited by tile-drainage. Generally the top soil is a dark-colored loam, with a subsoil of deep red clay, or clay of a yellow cast. This clay is a good index of the soil, the red being much superior to that of a yellow or white color. This red clay frequently contains as much food for plants as the top mould, and is even richer in some of the mineral elements, as is evidenced by farmers who plow deep when breaking up their lands in the fall, winter, or spring. The paler-colored clays have a tendency to hold water, and prevent its leaching through freely, which causes it "to bake" easily. The better lands produce finely cotton, tobacco, corn, wheat, oats, rye, barley, millet, and some of the grasses, but will not do so well for blue-grass. The spouty lands, though not so rich, produce excellent flax, oats, orchard-grass, timothy, and, if tile-drained, first-class corn and tobacco.

A good deal of the land in this county is inclined to be sour, as can be seen from the growth of dogwood, sourwood, persimmon, black gum, sorrel, pennyroyal, and broom-sage in the old fields. This can be remedied by a good top-dressing of lime. Any corn, or tobacco, or wheat land, treated to a compound of 150 pounds of gypsum (land plaster), ten bushels of ashes, one or two bushels of common salt, and 100 pounds of dissolved bone, to the acre, will, on this formation, yield most remunerative crops, which will astonish the farmer at their difference over what he now gets from the same land and for the same labor. This formula, to be effective, should be sown broadcast and harrowed in just before the crop is planted, and when the soil is well broken and prepared. All kinds of fruit will grow well in this county; but the

grape is peculiarly suited for the eastern and southern slopes of the hills; and if the proper varieties, such as the Concord, Ives Seedling, Delaware, and Hartford Prolific, are planted, and properly attended to, they will bring astonishing crops. With proper management and cultivation, the Concord will produce 10,000 pounds of good grapes to the acre on these lands, from which can be made not less than a gallon of wine to 13 pounds of grapes, or 750 gallons of wine to the acre.

Stock.—The people of Allen have not lived out of their great love for inferior breeds of what is known as “scrub stock,” although some good-blooded horses, cattle, hogs, and sheep are being brought into the county; but these are rather exceptions. Good stock can and will be raised everywhere in Kentucky, and Allen will not be the last county to find this out, and also to learn that it is cheaper to raise the better kinds than it is to keep up the old native breeds.

TOWNS.

Scottsville, named for Gen. Chas. Scott, the fourth Governor of the State, is the county seat, and is situated in a high, healthy locality, about the centre of the county, and contains about two hundred and fifty to three hundred people. It has a good brick court-house, two or three churches, good school-house, and many nice, comfortable private residences. *Gainsville* is eight miles north of Scottsville; *Port Oliver* eleven miles north; *New Roe* fifteen miles southwest; *Mt. Ariel* twelve miles southwest; *Butlersville* ten miles west; *Allen's Springs* ten miles northwest; and *Motley* seven miles northwest of Scottsville.

Of these towns, next to Scottsville, New Roe leads in population, having near two hundred; though all are pleasant places for business or residence. Allen's Springs have most excellent sulphur water, and are the resort of a large number of invalids every summer, who here find relief for many chronic complaints.

Streams and Mills.—This county is particularly blest with water power suitable for mills and factories.

Big Barren river forms the northern and most of the eastern boundary of the county, and during the wet months of the year affords good flat-boat and raft navigation. Slack-water navigation on this stream could easily make it suitable for smaller steamboats at all seasons of the year. The other smaller streams, on several of which are good mills and mill-sites, are Big and Little Trammel, Puncheon Camp, Long creek, Wal-nut, Big and Little Difficult, East, West, and Sulphur Forks of Bay's

Fork, Middle and Sulphur Forks of Drake's creek, John's, Rough, and Snake creeks.

The timber along these rivers and creeks is very fine, and consists of all classes usually found in the forests of Kentucky. The same may be said regarding the timber of the hill lands throughout the county.

Domestic Arts.—Before the late civil war, cotton, flax, and wool were everywhere converted into home-made cloth through the industry of the female portion of the population, and jeans, flax-linen, and linsey composed the wearing apparel of more than seven eighths of the people; but, like everywhere else, the good old days of the flax-wheel, the cotton-wheel, and the hand-loom are passing away, and now few wool and cotton cards are used, and the goods of northern factories are carrying off each year all the surplus gains made by the industry of the people. Some families, however, hold on to the old plan, and are never known to speak of "hard times." Milk, butter, honey, eggs, poultry, beeswax, feathers, and dried fruits are produced in ample supply for home consumption, and a considerable amount of some of them sold beyond the limits of the county, but only a tithe of what will be exported should the Cumberland and Ohio Railroad be built, according to expectation, through the county. What Allen now lacks are railroad facilities, by which she may reach the outside world with the bountiful productions of her soil; at present, all her produce has to be hauled over bad roads long distances to get to a railroad that may take them to a market.

Schools and Churches.—There are fifty-eight common school districts in Allen county, in fifty-seven of which schools were taught last year. In five colored districts the schools were taught. These schools have been generally well attended, and give very good satisfaction to the patrons and parents of the children taught. The principal Christian denominations in the county are the "Ironside" Baptists (old school), the Reformers, Methodists, Presbyterians, Missionary Baptists, and Universalists. The church buildings are generally spacious and comfortable, and though not so handsome to the eye as those in the cities, yet they will answer the purposes for which they were intended, and probably contain as pure and as faithful worshipers as do the more pretentious edifices, where the rich hold forth and listen to the eloquent sermons of the high-salaried priests or preachers, who lengthen out their speeches and their piety in proportion to their pay.

The Future.—Allen county is susceptible of great improvement in her capacity for producing fine crops of corn, wheat, tobacco, potatoes, and hay, provided the farmers will study well the nature of their soil, and

apply the necessary fertilizers in such quantities as they may be needed on the various crops. Our article on fertilizers will show them partly how this can be done, and a series of experiments will do the rest.

ANDERSON COUNTY.

Anderson county, named for Richard C. Anderson, was organized in 1827, out of parts of Mercer, Franklin, and Washington counties, and is bounded north by Franklin, east by Woodford, south by Washington and Spencer, and west by Spencer county.

Geological Formation.—This county is located altogether on the lower Silurian or blue shelly limestone, from which formation its soil is derived. The different stratifications of this geological period vary exceeding in their marly and fossiliferous character, which makes a corresponding difference in the soils produced by their disintegration. For this reason, we find much of the soil of Anderson exceedingly fertile in plant food, while other parts are lacking both in potash and phosphorus. This gives a diversified character to the lands of the county, which is further augmented by the rolling surface in some portions. The level lands are all good, and even the hills produce excellent blue-grass, which appears to be a natural production of the Silurian earths. The Kentucky river marble is found in the eastern part of the county, on the Kentucky river and on Bond creek, and reaches as high as the high-water marks, and over this is a good compact blue limestone. There are probably no minerals in this county in sufficient quantities to be worked with profit, although small quantities of lead ore may exist similar to that found in Franklin and Woodford counties. The white oak lands could be greatly improved by the addition of land plaster, German kainit, salt, and dissolved bone-dust. A compost of these materials, costing not over three to four dollars to the acre, would increase the yield of wheat probably ten bushels to the acre. What is needed by the worn lands is potash, nitrogen, and phosphoric acid in small quantities, in order to make this soil produce equal to any in the State.

Streams and Factories.—The Kentucky river, which forms the eastern boundary of this county, is navigable all the year by steamboats. The Little Benson, Bailey's run, and Gilbert's creek flow into the Kentucky river. Salt river, a fine stream of good water-power, passes through the center of this county, and with its tributaries—Crooked, Fox, Hammond, and Stony creeks—affords many fine sites for factories or mills. Upon these streams are several fine merchant mills, and numerous distilleries, which make the celebrated Anderson County Whisky; this is very nearly allied in quality, if not identical, with the world-famed "Old Bourbon."

Some twelve to fifteen of these distilleries now pay into the Treasury of the United States, on the whisky tax every year, enough money to educate all the children, and make comfortable all the poor people of the entire county, with a considerable surplus left over. The people of Anderson have never engaged largely in any other manufacturing business than the making of whisky, although Salt river affords some fine sites for running machinery in other industries.

Domestic Arts.—Poultry, butter, honey, household manufactured goods, and fruits are produced in considerable quantities beyond what is needed for home consumption; these are sent to Frankfort, Lexington, and Louisville for a market. Formerly, every farmer raised flax enough for family use, and the wheel and loom could be heard in steady music throughout the county, but now few families depend on home-made clothes, even for their every-day wear. Machinery and skilled labor in Massachusetts and other countries have paralyzed the domestic arts in Kentucky, until all the surplus of the people's labor is gathered into the vortex of the trade centres.

Crops and Fruit.—Hemp grows well in some of the lands of Anderson county, while tobacco, corn, wheat, rye, oats, barley, millet, orchard-grass, timothy, herds-grass, and clover flourish in all parts of the county. Excellent peaches, apples, plums, grapes, and berries can be raised on any of the high lands.

Stock.—The finer bloods of horses, cattle, hogs, and sheep are becoming very common, and with many farmers great care is taken in selection of breeds. The horses and mules of Anderson county are remarkably tough and active, and are ranked among the best in the State. The beef cattle, principally of the Short-horn stock, cannot be excelled, except in a few places in the State, while the long-wooled sheep raised here compare favorably with any bred in the West.

TOWNS.

Lawrenceburg, named after Commodore Lawrence, is the county seat, located about the centre of the county, and contains between four and five hundred people. The public buildings consist of a very fine courthouse, a banking house, four or five churches, school-houses, &c. There are quite a number of beautiful private residences, and some mills and smaller factories. *Rough and Ready*, a neat village of nearly two hundred inhabitants, lies upon the turnpike road between Lawrenceburg and Frankfort, four miles from the former place. *Camdensville*, situated on Salt river, about eight miles west of Lawrenceburg, has a population of about one hundred, and is well located for a manufacturing town. *Johnsonville*, on the Washington county line, is a nice village of one hundred people, with considerable local trade. *Van Buren*, on Salt river, some eighteen miles from the county seat, is a flourishing village; and *Rippsville*, three or four miles south of Lawrenceburg, contains about fifty people.

Schools and Churches.—Public schools of the State system are taught in nearly every school district of the county, and give very general satisfaction. There are several select schools in the county, and a good seminary at Lawrenceburg, all under the charge of able, efficient teachers. Education of the children is generally well attended to by parents in this county; and there will be very few in the next generation, white or black, who will be unable to read and write, and have a good common school education.

The prevalent denominations of church members are the Methodists, the regular Baptists, the Presbyterians, the Reformers or Christians, with some few Episcopalians, Catholics, and Unitarians. Generally the attendance at church meetings is good; and every class of Christians appears equally prosperous in the promulgation of their different views, without any particular rivalry, other than is usual between members of different denominations.

Facilities for Commerce in Anderson are not very good within the county, owing to the lack of railroads; but she lies not very far off from the line of the Louisville and Lexington Railroad, and is bordering on the Kentucky river, to each of which are good, permanent turnpike roads, so that hauling by wagons, and travel, is not burdensome. When cheaply-built, narrow-gauge railroads become more fashionable, and money more plenty, the traveling facilities of this county will be greatly improved.

BALLARD COUNTY.

Ballard county, named for Captain Bland Ballard, was formed out of parts of Hickman and McCracken in the year 1842. It is situated immediately along the Ohio river, opposite Cairo, at its mouth, and contains about four hundred square miles. On the north it is bounded by the Ohio river, east by McCracken and Graves, south by Hickman county, and west by the Ohio and Mississippi rivers. The geological formation of this section is entirely quaternary, there being no rocks except occasional ferruginous sand shales intermixed with some of the sand stratas. No ores of consequence are found in this formation, and the subsoil, which is altogether sedimentary, frequently varies according to the different currents which prevailed at the time of its formation. The top soil is a vegetable loam, intermixed with clay and sand, which give it a quick, lively action in the growth of cereals, cotton, flax, and tobacco.

The northern half of the county is quite level, and was originally known as "barrens," although entirely different from the geological formation of the "barrens" of the sub-carboniferous groups. These "barrens" lying north of Mayfield creek form a high, beautiful plateau of free, generous soil, covered with tall, succulent native grasses, interspersed with millions of gaudy flowers, were once the pasture lands of thousands of deer, elk, buffaloes, wild turkeys, grouse, pheasants, rabbits, &c., but are now the fields on which are raised the finest grades of tobacco known in the western market—some of which has been sold as high as from \$350 to \$425 per hundred pounds in the leaf. These lands also produce good crops of corn, wheat, barley, rye, oats, and other farm crops. All grasses do well here, except blue-grass, which seems so very dainty in its taste as to feed ravenously only on ground formed from the blue limestone disintegrations.

South of Mayfield creek the lands are more rolling, with a deeper top-soil, and a different growth of timber. These produce better flax, cotton, corn, and grass, but not such fine tobacco. Apples, peaches, plums, nectarines, apricots, nuts of all kinds, and berries, including grapes, flourish in every part of the county. The river bottoms everywhere are a deep alluvial soil, exceedingly rich, black in color, and capa-

ble of endless croppings, without exhaustion. No lands can be superior to them in fertility.

Streams.—The grand Mississippi and the beautiful Ohio form the western and northern boundary of the county, and afford uninterrupted navigation throughout the year to all parts of the Mississippi Valley. There are few sections of any country that have such navigable water facilities as Ballard county, yet in creeks and small rivers she is deficient, Mayfield creek being the only small stream of any importance. Some few little creeks and bayous, however, drain off the surplus water, so as not to render the county swampy.

The timber south of Mayfield creek, as well as along the banks of the Mississippi and Ohio rivers, is quite abundant, and of good quality, the prevalent growths being the different varieties of oak, cypress, gum, elm, hickory, sugar-tree, locust, maple, wild cherry, hornbeam, iron-wood, pecan, poplar, ash, walnut, butternut, buckeye, cucumber tree, sassafras, wahoo, beech, black jack, cottonwood, sycamore, box elder, linden, redbud, willow, witch hazel, &c., &c.

Live Stock.—The citizens of this portion of the Commonwealth have not paid the same attention and care to the pedigrees of stock, as has been done in the Blue Grass Region. The *king* they enlist under here is tobacco, for which every thing else is made to play a second part; "*a crap*" means a tobacco crop, and they look almost exclusively to this staple for all the net money brought into the county. Stock of all kinds have been neglected, although there are but few places where cattle, hogs, and mules could be raised at less expense, or of a better grade; enough, however, are raised to supply the home demand, and some for the Southern markets. There are a few public-spirited individuals in the county who are beginning to introduce fine horses, cattle, hogs, sheep, and poultry, all of which succeed as well as could be desired, and are much more profitable than the native "scrub stock" of the country. No doubt the time is not far distant when every farmer will learn the economy of feeding only such stock as will mature early, and will take on the qualities most desirable for use and profit.

TOWNS AND VILLAGES.

Blandville, called from the Christian name of Captain Bland Ballard, situated about the centre of the county on a beautiful plateau, on the north side of Mayfield creek, is the county seat, and contains about four hundred and fifty to five hundred persons. It has a good, well-built court-house, clerk's office, jail, two or three nice churches, fine school-

houses, and several elegant private residences. There are also several large store-houses, and a tobacco factory and mill.

Twelve miles from Mayfield, close to the Hickman line, is *Milburn*, nearly the same size with the county capital, a place of considerable local trade, containing two churches and a fine school; *Lovelaceville*, near the McCracken line, eight miles from Mayfield, is a place of good trade, having several stores, a school, churches, and tobacco factory, with a population of about two hundred and fifty. In the northern part of the county are *Ogden's Landing*, *Barlow City*, and *Hinkleville*, all places of good local trade and pleasant residences. *Barlow City* contains over one hundred and twenty-five inhabitants, and is growing in importance; *Fillmore* is a little below *Fort Holt*, which is opposite Cairo, Illinois, and is the Kentucky termination of the New Orleans, St. Louis, and Chicago Railroad, which runs through the county from south to north.

Schools and Churches.—There are now fifty-nine district schools taught under the common school system of the State, besides the academies in the larger towns. This affords ample opportunity to all the parents of the county, who will accept of the advantages, of having their children receive a good common education, sufficient to qualify them for the ordinary routine business of life. The prevailing church denominations are the Baptists (Missionary and Hard-shell), the Reformed Christians, Methodists, and Presbyterians, with a lesser number of Catholics, Episcopalians, and Unitarians. There are several lodges of Freemasons and Odd Fellows in a very prosperous condition.

Domestic Arts.—The people of Ballard are mostly emigrants from other counties in Kentucky, or from Virginia and North Carolina, and have taken with them the manners and customs of their fatherlands. Formerly, the spinning-wheel and the loom were heard at every house, and homespun cloth was the wear of nine tenths of the population. Flax and cotton grew finely in all parts of the county, and was used by the female portion of the population in supplying all the needs of the family; besides, a quantity of the hand-made linen, jeans, and linsey was exchanged for "store goods" for "Sunday clothes." Everybody was then happy, and no one knew what "hard times" meant; but the cheapness of eastern-made goods have now very nearly driven the "homespun" out of the market, and the people here, as elsewhere, have learned to send all their surplus earnings each year to the great moneyed and manufacturing centres, and are using now as necessities what were

formerly reckoned merely as luxuries. Bees flourish here in a wild state equal to any place in America, and in past years the people obtained as much honey as they needed for family use from the hollow trees of the forest. A large amount of dried fruit, feathers, poultry, eggs, and butter is sent from this county, and finds a ready market at Cairo, Illinois, and at Paducah, Kentucky, or else to the steamboats plying on the rivers.

What is Needed.—The peculiar nature of the uplands of this county is such, that manures applied to the surface will not last like they do on lands with a red tenacious clay subsoil, underlaid with limestone. This makes it altogether necessary in order to keep up the productive capacity of the ground, that with every crop chemical fertilizers, in small quantities, should be scattered broadcast over the land, in order to give the vegetation the proper proportions of plant food. It would be too expensive to apply these fertilizers faster than they were consumed year by year. In case farmers will not use chemical fertilizers in this way, then the next best thing is to turn under "green crops" of clover, cow-peas, buckwheat, rye, oats, or spurry, which will greatly renovate the worn out lands. Deep plowing, too, will pay well in the southern part of the county, as there is considerable of potash and phosphoric acid in the subsoil. Flax would succeed and pay well, in case the newly patented flax-brake, that breaks at a nominal cost, could be introduced into this section.

* BARREN COUNTY.

This county was established in 1798, and derives its name from an extensive *prairie*, which, by the early pioneers, was called *barrens*. It is a singular fact that the territory embraced by said barrens, instead of being poor and unproductive, is blessed with unusual richness of soil. Barren county is bounded on the north by Hart, east by Metcalfe, south by Monroe and Allen, and west by Warren, and contains an area of four hundred and ten square miles. There are many water-courses in this county, among them Beaver creek, Skagg's creek, Boyd's creek,

* We are indebted to Gen. J. P. NUCKOLS for this excellent sketch of Barren county.

Glover's creek, &c., beside its southern boundary of twenty-five miles or more on Barren river. On this river, and on the margin of these creeks, the land is rich and productive, embracing many thousand acres. Altogether this is a good county. The soil is generally good, resting on a bed of limestone, detached portions of which are continually decomposing and fertilizing the ground. Tobacco is cultivated with success, and is one of the chief articles of export. Corn, wheat, rye, oats, barley, &c., are grown abundantly in this kindly and remunerative soil. Apples, peaches, pears, and all fruits common to the climate, are grown to great perfection. A marked peculiarity of this county is the production of petroleum, which is found in large quantities on Boyd's creek, about six miles south of Glasgow. It was discovered about the year 1863, at a depth of 120 feet from the surface, and for a number of years was of little value, owing to some trouble in refining, and a want of facilities for transportation. Subsequently, however, a process was discovered, whereby the crude material—useless and offensive—was reducible to a beautiful and cheap burning fluid; and the building of a railroad to Glasgow puts it in easy access of market. Petroleum, in this part of the world, seems to be an anomaly; its origin, extent, geographical position, and duration, are all problems at present difficult of solution. There is no substance of kindred nature known to exist nearer than Burksville, in Cumberland county, a distance of forty miles or more. It is here, however, in quantities apparently inexhaustible, whether deposited in its present state by the great Creator, when the earth was first flung out in space by His omnipotent hand, or whether it is the product of some decomposing or commingling subterraneous substances, is not revealed, and the secret will, in all probability, remain forever locked in the Arcana of nature. Be that as it may, mankind is benefited by its discovery and use, furnishing, as it does, the cheapest light known.

Glasgow, the county seat, is picturesquely situated at the terminus of the Glasgow Branch Railroad. It is a flourishing, prosperous town, containing about twenty-five hundred inhabitants. Society here is adorned by many old and respectable families, and men of eminence. Altogether, few towns in the State are more attractive. There are a number of other towns in this county, notably *Cave City* and *Glasgow Junction*, on the Louisville and Nashville Railroad, *Hiscville*, *Roseville*, and *Temple Hill*.

Characteristics.—The people of this county are not surpassed for intelligence, virtue, and obedience to law. They are not indifferent to

politics, and take a favorable view of Democracy as taught by the fathers. The water-courses in various portions of this county furnish great facilities for running machinery, and the result is many flouring and other mills of much value. Here, too, are great forests of fine timber, such as black walnut, cherry, poplar, and apparently inexhaustible quantities of white oak, of a superior quality. A good deal of the last-named species is shipped by rail, and sold to the plow and barrel factories of Louisville. The other varieties named are manufactured and used extensively for building, and for furniture at home and abroad. There is no doubt but it will all be cut down, and used as fast as the wants of man can accomplish it; and the grand old forests of Barren county will fall before the relentless axe, giving place to waving fields of grain and tobacco.

Education.—In common with the other counties of the State, Barren county has shown much interest in educating her children, and her march is onward. In addition to the common schools of the county, Glasgow boasts of two excellent institutions of learning. Glasgow Female Baptist College is a fine building, beautifully situated on an eminence; is now in its second or third year. It is presided over by Professor Jas. A. Fuqua, with a competent corps of assistants; is well patronized, and under the management of the distinguished principal, bids fair to become one of the leading institutions in the State. Also Professor Wm. Mills' Normal School is an institution of learning of which any place might justly be proud.

With her ancient magnificent boundaries, almost a Commonwealth in extent, undulating uplands, her hills and beautiful valleys, her winding, clear, limpid streams, little wonder that her children, wherever dispersed around the globe, turn to her with feelings of pride and affectionate reverence.

BATH COUNTY.

Bath county was formed in 1811 from a part of Montgomery, and contains about 260 square miles of territory.

It is one of the most varied counties in the State in its geological location—exhibiting every class of rocks from the upper Cambrian or lower Silurian up to the carboniferous. Owing to the great number of mineral springs, and the resemblance of some of them to similar medical waters of old England, the name Bath was given this county.

The blue limestone (lower Silurian) extends from Paris, in Bourbon county, east to Owingsville, where the overlying rocks of the upper Silurian are found. As we go east, we meet with the Devonian and Waverly series and shales, then the sub carboniferous limestones, and then the millstone grit and conglomerate. In these latter formations are large beds of iron ore, and good workable beds of sub conglomerate coal. This coal is found in the southeastern part of the county, and its outcrop can be traced along the ridge that divides the head waters of Gilladie and Indian branches of Red river, and the head waters of Beaver, Blackwater, Duck, and Salt Lick creeks as far west as Slate creek. Upon Clear creek the coal is three feet thick, with clay parting of one foot. This coal lies very close to the sub-carboniferous limestones, in some places not over fifteen to fifty feet. This coal is used in Bath and Montgomery counties to a large extent in blacksmith-shops and for grates, and gives good satisfaction. The sub-conglomerate iron ores of this location are very extensive. Lying within a few feet of the sub-carboniferous limestone, they extend almost without limit along this series of rocks from Carter county to the Tennessee State line. These iron ores are generally the varieties known as limonite or carbonate, and overlies the sub-carboniferous limestone in beds of one to four feet in thickness. The close proximity of these sub-conglomerate coal and iron ore beds will cause iron-masters to seek these localities for placing furnaces where pig metal and bar iron can be made at the very cheapest possible rate of almost any other section of the United States.

Soils and Crops.—Bath has as great a variety of soils as any other county in the State. All that portion of the country lying west of

Slate creek, and west and southwest of Owingsville, located upon the blue limestone formation, has as good and fertile soil as any in Kentucky, with a rich subsoil of red clay that holds fertilizers equal to the Fayette county land. Hemp, blue-grass, and all the cereals flourish in this formation with the greatest luxuriance. As we proceed eastward from this lower Silurian (blue limestone rock) the soil changes for the worse, until, passing through the Devonian and Waverly shales and sandstones, we come to the bluff or sub-carboniferous formation, which underlies the iron and coal beds. Here the disintegrations of this stone make a rich, compact red clay as a subsoil, with a top loam of calcareous and vegetable matter that is peculiarly adapted to the production of corn, flax, tobacco, and all the smaller cereals; also for fruit, berries, and every species of nuts. This bluff limestone group makes a soil nearly equal to the blue limestone for everything except hemp. After passing these good farming lands going eastwardly, we are at once brought upon the millstone grit and conglomerate sandstones, where iron and coal exist without limit, but deep ravines, tall bluffs, and poor lands everywhere surround us. Here we find on the top of ridges pine trees and whortleberry bushes in abundance, with the beautiful mountain laurel, with its gaudy flowers overhanging the precipices. The scenery is elegant, and almost, with the iron and coal, repays for the loss of rich lands. Much of the land in this county, lying on the Devonian and Waverly series of rocks, is "crawfishy and cold," and can be greatly improved by the addition of lime or gypsum and bone-dust. Gypsum (land plaster) and dissolved bone dust, at the rate of about one hundred and fifty pounds each, sown on these when the ground is in good order for planting, and harrowed in just before the crop of corn, wheat, flax, or tobacco is sown or planted, will nearly double the yield, and add greatly to the profit of the farmer, besides saving him a great deal of labor.

Mineral Springs.—Bath county is noted for its excellent mineral waters, which appear in several parts of the country, and contain ingredients which seem to be specifics for a great number of chronic diseases. The sulphur and chalybeate waters of these springs are not near so cold as are the majority of the clear, bold limestone springs that burst out of the bluffs or ground near to them, which fact has caused a great deal of conjecture regarding their origin; but now the geologists have generally satisfied the curious of both the origin and cause why these waters are not so cool, as the springs originate in entirely different geological

formations, and are consequently brought in contact with cooler or warmer rock-beds in their underground travels.

Rivers, Creeks, and Roads.—Licking river flows along the eastern and northern boundary of the county, and affords several fine sites for factories and mills. Its tributaries are Flat, Salt Lick, State, and Beaver creeks, all of which have some good mill-sites. The rivers do not rise to the dignity of navigable streams; but Licking is susceptible of slack-water improvements, and will no doubt some day be made navigable for steamboats, greatly to the advantage of this section of the State. Turnpike roads are numerous in the richer soiled portion of the county, and give easy overland access to the Kentucky river and the railroads in the adjoining counties. The Lexington and Big Sandy Railroad, now partly under contract, will run centrally through this county, and, when completed, will give Bath easy and quick connection with all the railway lines of the Western States.

TOWNS AND VILLAGES.

Owingsville, the county seat, is a handsome, well-located town, of some six hundred inhabitants, situated about the centre of the county, and at the intersection of the rich blue-grass lands with those based on the Devonian rocks.

It has a good court-house, three churches, two banks, many handsome private residences, one or two newspaper offices, and a large seminary building, with other necessary buildings for a first class school.

When the railroads now building are completed through Owingsville, no doubt it will become a place of great commercial and manufacturing importance.

Sharpsburg, twelve miles west of Owingsville, has some three hundred and fifty people, and is well located in a rich section of country; it does a very large local trade, and shows a thrifty, energetic, and highly intelligent population. It has also some four or five churches, a bank, a fine school-house, and many excellent residences.

Wyoming, a beautiful village of some one hundred and fifty people, is situated on Licking river, and is well located for factory or mill industries.

Bethel, four miles north of Sharpsburg, and *Polksville*, seven miles from Owingsville, are each pleasant villages, with good local trade.

The Smaller Industries.—Hemp, flax, wool, fruit, poultry, and bees are each so easily raised in Bath, that the people naturally, in the early settlement of the country, fell into the habit of making all their own

cloth, and supplying their own wants in dried fruits, cider, brandy, poultry, eggs, honey, feathers, and other luxuries of home growth. Their distance from the larger cities and towns has preserved to a considerable extent these primitive habits, so that we still find in many families the flax-wheels, the looms, and the spinning-jennies, and Kentucky jeans and linseys and flax-linen form a large part of the every-day wear of a majority of the people, particularly of that class who never complain of "hard times," and always have on their farms poultry, eggs, butter, and some feathers, and other home products, more than are needed at home. Not craving "the fashions," they live on the fat of the land, and under their own "vines and fig trees" bid defiance to the commercial storms of the outer world. What influence the railroads will have on these customs will be seen when the iron horse is heard in the county; we fear that the shrill whistle of the locomotive will deaden the good old-fashioned music of the wheel and the loom, as it has done elsewhere, and carry the surplus of these sturdy farmers to the money centers, and teach their children extravagant habits; but if they will cultivate a proper system of rigid economy, in time, possibly, the change will be for the best.

Schools and Churches.—The public school system of the State works well in this county, and good, efficient teachers are now instructing the children in nearly every school district. Besides, there are fine private schools in different sections of the county, and excellent seminaries and high schools in Owingsville and Sharpsburg, each under the charge of learned professors. The principal religious denominations are the Methodists, the Hard-shell and Missionary Baptists, the Reformed Christians, the Presbyterians, and some few Episcopalians, Catholics, and Unitarians. There are fine churches in Owingsville, Sharpsburg, Wyoming, Bethel, and other towns, besides comfortable meeting-houses in every neighborhood in the country.

Vineyards.—The bluffs, ridge lands, and high plateaux in the eastern portion of this county, are peculiarly adapted to the growth of peaches, plums, and grapes. Cherries, too, will do well on all the lands based upon the Devonian and Waverly groups of rocks. The calcareous slopes, particularly those facing east and south, if well prepared and the vines well attended, will produce the Concord, Hartford Prolific, Ives Seedling, Delaware, and similar grapes in great abundance; so that wine, at even thirty cents per gallon, can be made, which will remunerate the farmer better than any other kind of agricultural industry.

Live Stock.—The finest and best pedigrees of horses, mules, cattle, hogs, and sheep are to be found in this county, where they flourish on the rich native blue-grass of the western half, equally as well as in Bourbon or Montgomery counties. It is a curious fact, that the better breeds of all kinds of stock appear to follow the best grasses, regardless of any other attractions, and nowhere is this more evident than on the variegated soils of Bath. Since the late civil war there has been a great improvement in the method of handling stock, and large fortunes have been and are being made by the fanciers of different favorite breeds. No doubt this praiseworthy fashion of improving all kinds of animals will continue until the “scrubs” will all be weeded out of the country, and the keeping of them known hereafter only as an error of the past.

BELL COUNTY.

Bell county, named in honor of Joshua F. Bell, was organized in 1867 out of parts of Knox, Harlan, and Whitley, and is bounded on the north by Clay, on the east by Harlan, south by the Virginia and Tennessee State lines, and west by Whitley and Knox counties.

Geology and Minerals.—The carboniferous rocks underlie every part of this county, except that there is a very narrow fault running diagonally through the county from northeast to southwest, formed by the upheaval of the highest peaks of the Appalachian chain, or by the subsidence of the northwestern areas. This fault lies immediately between Straight creek on the northwest and Cumberland river on the southeast, and exhibits a very confused mass of rocks of the Waverly shale, the sub-carboniferous and carboniferous rocks. The Cumberland river intersects it at or near Pineville. Possibly, in some of the mountain gorges, this or collateral faults may show much lower stratas than the Waverly group. The face of the country is very mountainous, and full of ravines and tall precipices. The Kentucky ridge, the Little Black Mountains, Pine Mountain, Log Mountains, Cumberland Mountains, Laurel Mountain, and Black Mountain, are some of the most noted peaks and ridges in Bell county. Old traditions tell of vast quantities of

silver ores that were found in these mountains by the Indians, some Frenchmen, and a Virginian by the name of Swift; but the Geological Surveys, so far, have failed to discover any such ores, or any rock formation that would likely contain them, although, possibly, at some points in the great fault above referred to, there may be injected, by igneous action from below, leads of metal similar to those found in the metamorphic rock of the Unaka range, in North Carolina and Tennessee, which are not more than 75 to 80 miles to the southeast. As yet, however, none of these metamorphic or granitic rocks have ever been found *in situ* in Kentucky. We think, therefore, that the existence of silver ores in any part of these mountains is exceedingly problematical, and that search for them will be labor thrown away. There are, however, in this county immense wealth in iron ores and coal, probably as much as in any other county in the State. In fact, the thickest beds of coal in the State (14 feet) are found in Bell county, and also iron deposits without limit and so rich that they require poorer ores mixed with them in order to flux to the best advantage. These coals and iron ores can be found on almost every mile of territory, with timber without stint, and the very best building stone in close proximity, either for houses or stacks for furnaces. Much territory can be found that would give a yield of coal and iron worth to-day, if in pig metal, at the metropolitan markets of the world, not less than \$175,000 to \$180,000 per acre. The soil along the river and creek bottoms is very rich, and that on the north sides of the mountains is fertile, and not much given to wash; but the ridges and eastern and southern exposures are generally rocky and poor. All kinds of mountain, flowering, and berry plants and shrubs are here found without limit.

Timber and Stone.—Bell county abounds in all kinds of fine upland timber, such as pine, ash, oaks of all kinds, hickory, chestnut, maple, hemlock, cypress, walnut, cherry, &c., &c. There are also much of the best quality of stone for building or other purposes, similar to the neighboring quarries of Tennessee in Hawkins county, where is found the beautiful variegated marble, now so famous among lapidists. Free-stone, of fine grit, suitable for whet-rocks or grindstones, are to be found along the outcrops of mountain ranges.

Crops and Fruit.—Wheat, corn, oats, rye, barley, and tobacco grow finely on the better lands. The ridges and southern and eastern exposure of the hills are well adapted for vineyards; and no part of Switzerland can show better specimens of grapes than those grown in

this county. Yet the people have never thought of grapes as a crop, or wine as a drink; they have the native Kentucky taste for the "chemical extract of old corn," and seem to think any other beverage tends towards effeminacy.

Health and Mineral Waters.—Probably no part of the world gives more healthy bodies to men than the mountain counties of Kentucky. The water, the air, the scenery, the exercise necessary to ascend and descend the hills, the free ventilation of the houses, many of which know not what chinking and plastering means, all contribute to give fine appetites and strong, vigorous muscles, and to develop a power of standing fatigue which is indeed wonderful. Mineral springs of iron, carbonic acid gas, sulphur, alum, magnesia, lithia, and different kinds of salts, in happy combinations, are to be met with in all parts of the country, and which will in the future become places of great resort.

Transportation and Streams.—As yet, there are very poor traveling or transportation facilities in Bell county. The natural old-fashioned way of walking or riding horseback are chiefly practiced; but there is a promise of the Kentucky and East Tennessee Railroad being built through Cumberland Gap, and also of the Lebanon Branch of the Louisville and Nashville Railroad being extended in that direction. In case either is done a great development at once will take place throughout the mineral and coal regions of this part of the State. Cumberland river, in this county, is not navigable, owing to rocks and falls. Slack-water navigation, however, could easily be accomplished on this stream and some of its tributaries. There are many fine sites for furnaces, factories, and mills on Straight creek, Right Hand creek, Left Hand Fork, Stoney, Turkey, and Caney creeks, on the north of Cumberland, as well as on Clear creek, Big and Little Yellow, Clear Fork, Cannon, Bennett's, Puckett's, Browner's, and Cabbage creeks, on the south side of Cumberland river.

TOWNS AND VILLAGES.

The people of Bell county are not much given to the vice of concentration. They gather very little into towns and villages. *Pineville*, the county seat, has several stores and hotels, a comfortable court-house, a fine school, and several good private residences, but a small population. The only other places of importance are *Calloway* and *La Fontaine*, pretty villages, that do considerable local traffic.

Schools and Churches.—The common school system of the State furnishes teachers in nearly every district in the county for five months

in the year. There is two or three good academies, and several private schools where the higher branches are taught. The Hard-shell Baptists and Methodists are the principal denominations, although there are persons of other denominations scattered through the county. There are some well-built churches, but the majority are of primitive architecture, the good people relying more upon true piety and faithful zeal than upon fine buildings or large salaried preachers.

BOONE COUNTY.

Boone county, the most northern in the State, was named for the famous Western pioneer, Col. Daniel Boone, and was formed in 1798 out of a part of Campbell county. It is situated immediately along the Ohio river, which divides it on the north and west from the States of Ohio and Indiana; on the east it is bounded by Kenton, and on the south by Grant and Gallatin counties.

Geological Formation.—The lower Silurian formation underlies this county, but in different series of rocks from those coming to the surface in Fayette and Bourbon counties, which gives to this section an entirely different face. The stratas on the surface in Fayette county consist of thin shelly calcareous limestone, very easy of disintegration, and exceedingly rich in fossils and marls. In Boone, the rocks coming to the surface are different varieties of the peculiar silicious mudstone, averaging about one hundred feet in thickness, with an elevation of from two to three hundred feet above the Ohio river. These rocks are of a buff or yellowish-white color, with but few fossils, and none of the rich marly stratifications found in the lower Silurian stratas of Central Kentucky; they contain a large percentage of silex, and a very small proportion of lime, and much sulphuric acid and magnesia. This formation exhibits a succession of nicely rounded hills, less abrupt than where the marly limestones prevail. More or less manganese is mixed on these mudstones, which gives them occasionally dark or speckled spots.

The salt and sulphur springs, particularly of Big Bone Lick, probably take their origin from a lower stratification of calciferous sandstone (Cambrian), which is not seen in any of the outcrops in Kentucky.

Soil and Crops.—The rolling, hilly surface of the county is due to the stratas of mudstone from which the soil is formed, and from which it takes its distinguishing characteristics. Some varieties of this rock give a cold, wet beech land, while another strata makes a better quality of soil, the growth of which is hickory, oak, poplar, sugar-tree, walnut, hackberry, elder, and locust. The buckeye land on many hill-sides and hollows grows excellent corn and wheat. The oak lands are best for tobacco, and the sugar-tree, beech, white and blue ash soils will bring good hemp. This latter land is generally from two hundred and fifty to three hundred feet above the Ohio, and is made by the disintegration of a blue limestone, containing an abundance of fossil shells; these rocks are found in their natural position between the towns of Florence and Union. The grade of tobacco grown on the oak lands in Boone is very fine, known as the "Maysville Leaf" or "Fine Cutters," and is much prized in the markets of Louisville and Cincinnati. Deep plowing, green crops turned under, and chemical fertilizers, particularly small quantities of nitrogen, potash, and phosphoric acid, would greatly improve a large majority of the lands in Boone county, and add greatly to their yield of tobacco or the cereals.

Grapes can be grown advantageously on the east and south sides of the hills, and plums, peaches, and apples would all do well on the high-lands.

TOWNS.

Burlington, the county seat, is handsomely located on Gunpowder river, a little north of the centre of the county, and contains about three hundred people. It has a good court-house, several churches, a good seminary building, and many fine private residences.

Petersburg, pleasantly located on the Ohio river, is the largest town in the county, with a population of about five hundred. It contains good churches, school-houses, and many excellent private residences, and is quite a business point.

Florence, six miles from Burlington, is a handsome town of some four hundred population, with a considerable local trade.

Taylor'sport, on the Ohio, has a population of about one hundred and fifty, who carry on quite a large business in dry goods, and in shipping to Cincinnati and Covington.

Grant, a nice village on the Ohio, also does an active traffic. Its population is about seventy-five to eighty persons. There are several other villages, all thriving, viz: *Walton, Bullittsville, Belview, Beaver Lick, Carlton, Constance, Francisville, Hamilton, Hebron, Verona, and Union.*

Schools and Churches.—The common school system of the State has been working well in this county, and nearly all the districts have been supplied with teachers ; besides, there are several good private schools in the county, and an excellent seminary or academy in all the larger towns. The Teachers' Institute of the county, at its last meeting at Burlington, numbered fifty-one enrolled members, all actively employed teaching in the county. This showing is sufficient to prove that the people are awakened to the necessity of properly training the children of the county, and also that every person desirous of learning can easily obtain a good common school education free, or at very small cost.

All the Christian denominations have churches in the county, which appear well attended and prosperous, and the general tone of society is highly elevated, both morally and intellectually.

Transportation and Travel.—No country can be better provided with traveling and transportation facilities than Boone county, with the Ohio river on two sides, and the Louisville and Cincinnati Short-line Railroad running along her entire eastern border. There is no part of the county where the whistle of the locomotive or the puff of the steamboat cannot be heard every few hours in the day during the entire year. There are but few good sites on the smaller streams for factories or mills, but there is easy water and railway communication to all the coal fields of Pennsylvania, Ohio, Kentucky, Indiana, and Illinois, in case the people ever become a manufacturing community.

Live Stock.—Good breeds of horses, cattle, hogs, and sheep are found everywhere in this county, and owing to the easy access to the markets of Covington and Cincinnati, an extraordinary good breed of cows for milk and butter has been bred, and also the finest Southdown sheep for mutton. The scrub stock is fast disappearing from the country.

Small Industries.—Owing to the proximity of Covington, Newport, and Cincinnati, the people of Boone county have been stimulated into the habit of raising large quantities of garden products for these markets, so that vegetables of all kinds are cultivated with skill and profit. Honey, fruits of all kinds, feathers, poultry, and eggs have become articles of extensive traffic along the river and at the railroad depots, probably as much so as in any other county of the State that has not a large city within its borders. Grapes and wine, too, are cultivated extensively in some neighborhoods, and afford employment to many foreign vine-dressers, with good returns to the land-owners. Very little home-

made cloth is now manufactured in the county, the people preferring to traffic their farm and garden products for goods of Eastern manufacture at the neighboring villages, towns, and cities.

Characteristics.—No better people can be found in the State than those of Boone, Owen, Grant, Gallatin, and the adjoining counties. Frugal and provident, they are not ashamed to work. Independent in thought, honest in action, plain in manners, temperate in habits, social by instinct, and patriotic by principle, they have a durable basis upon which to erect the highest order of manhood, which will make this population shine with a brilliant lustre in the future history of the State.

BOURBON COUNTY.

The Bourbon family of France is the source from whence this county took its name. The State of Virginia, in 1785, cut off Bourbon county from a part of Fayette, and named it in honor of the reigning family of France, who had given aid to the American colonies in their contest with England. It is now bounded on the north by Harrison and Nicholas, east by Nicholas and Montgomery, south by Clark and Fayette, and west by Fayette and Scott counties.

Geology and Soil.—This county is in the centre of the far-famed "Blue Grass Region" of Kentucky, and is based entirely on the upper Cambrian or lower Silurian limestone formations. The stratas which come to the surface are very rich in shell and corals, interstratified with rich, thin layers of marls. The soil is a decomposition from these rocks, forming a deep red, unctious clay subsoil, and a rich, loamy top soil, intermixed with black vegetable matter. The "Cane Ridge lands" are of a reddish or chocolate color, and are considered more permanent and less subject to washing than any other lands in the county. The face of the country is generally rolling and level, and presents a most beautiful appearance when in full verdure of crops and grasses.

There are no minerals of consequence in the county; some few lead and iron specimens have been found, but not in quantities sufficient for

any practical use. There are many ledges of rocks fit for building purposes, and thin shaly beds well adapted for making fences. These are utilized by the farmers so far that nearly all the land is fenced with good stone, which will last a lifetime.

TOWNS AND VILLAGES.

Paris, the county seat, is beautifully located along Stoner's creek, on a handsome plateau, which overlooks a large area of the fairest country in the West. It has an elegant, costly court-house and other public buildings, more than a dozen splendid churches, several large distilleries, mills, and factories, fine school-houses and academies, and many large and superb private residences. It is one of the richest and most prosperous cities of its size in America, and contains at this time over 4,000 people, and is rapidly growing. The Kentucky Central and the Lexington, Paris, and Maysville Railroads run through the city, giving an easy and quick connection with all parts of the West. Other railroads, destined to pass this point, are in contemplation, and will no doubt be built in a few years.

Millersburg is situated on Hinkston creek, at the crossing of the Lexington and Maysville Railroad, eight miles northeast of Paris. It has a population of nearly 1,000 persons; has grown up very rapidly; has many splendid churches and private residences, and is the seat of the Wesleyan University and the Millersburg Female College. The adjacent country is very beautiful, and this location is an excellent one for the education of male and female students of higher grade in their studies.

North Middletown, ten miles southeast of Paris, is a handsome town of 500 inhabitants, does a large local trade, and is the seat of the "Patterson Female Institute," an excellent high school, under the control of J. T. Patterson and other able teachers.

Besides these, there are several smaller towns and villages, each doing a good local trade. Of these, the most important are *Flat Rock*, *Centerville*, *Clintonville*, *Ruddell's Mills*, *Jacksonville*, *Houston*, *Hutchison*, *Shawhan*, and *Stony Point*.

Manufactures—*Bourbon Whisky*.—There are in Paris several large distilleries of the far-famed celebrated "Bourbon Whisky," and in the county this class of manufactories are so numerous that they "consume all the corn and rye of this and the adjacent counties, except what little is *wasted* on stock or in bread." The peculiar fine flavor of this whisky is given out by the superior grain from which it is made, and the natural

ingredients of the water, which are not found in just the same proportions anywhere else, except in the "Blue Grass Region of Kentucky." Like the Robertson county whisky of Tennessee, the Nelson county whisky of Kentucky, and the "Usquebaugh of the old emerald sod," it may be imitated, but can never be found in its native purity except in its own country. The legend of the county is, that Capt. John Hamilton, Maj. Spears, Col. Shawhan, and all the old original distillers of the pure article, drank their own liquors, and died at over one hundred years of age. Of course we state this as a legend, and not as a fact of our own knowledge.

There are many steam flour and saw-mills, wagon and carriage factories, woolen mills, and mechanic shops in the county, which supply largely the home trade, and furnish some exports.

Schools and Colleges.—No part of the country has better educational facilities than this county. The public school system extends over the county, and schools are taught in every district from five to ten months in the year. At Paris are several female colleges, a military institute, and two high schools. These are, the "Military Institute," under the control of Prof. Edgar, with an able corps of assistants; the high school of Prof. Lockhart, an academy of excellent standing; the classical academy of Prof. Yerkes, an institution of high character; the Bourbon Female College, under the control of Prof. Jas. A. Brown and his assistants; the Gath Female Institute, under the able management of Prof. C. E. Young and his assistants.

At Millersburg is located the "*Wesleyan University*," a Methodist college, with an endowment of nearly \$100,000. It has a good library, a fine literary society, five professors, and about one hundred students. Rev. W. H. Anderson, D. D., is the President. Also, at the same place, is the "*Methodist Female College*," an excellent institution, largely patronized by the members of that church and the general public.

At North Middletown is the "*Patterson Female Institute*," under the management of Prof. J. T. Patterson, assisted by several able teachers. Besides these, there are other private schools in the county where the higher grades of study are taught to those desiring a liberal classical education.

Churches.—No county in the State has finer average church buildings than Bourbon. Every town, village, and neighborhood has one, two, or three churches of different denominations. These are Methodist, Presbyterian, Baptist, Reformer, Catholic, and Episcopalian. There

are a good many Unitarians and Swedenborgians scattered throughout the county, and quite a number of Universalists, but no organized churches.

Live Stock.—Here is the Eden of fine horses, fine mules, fine cattle, fine hogs, fine sheep, and fine poultry. Everything here depends on blood; scrub breeds of stock are considered worthless for food or profit. Pedigrees are the text-books of the stock men, and "horse talk," "cattle talk," and "hog and sheep talk," are accomplishments that are so universal that no man can be considered well posted or finely educated who is deficient in this great and elegant attainment.

The soil produces blue-grass and corn to perfection, and these, together with the water, give the most solid, firm bone, the toughest muscles, and the greatest power of endurance to all kinds of animals. Consequently the horses, mules, cattle, hogs, and sheep are superior to those raised on any other lands than the blue limestone formation of the lower Silurian group. The farmers have learned that only fine breeds pay to keep, and consequently have long ago banished all inferior grades of stock from the county. The highest prices paid for fancy pedigrees of any kind of stock in the world are paid in Bourbon county, which is looked upon as a central stock county, in the heart of the Kentucky "Blue Grass Region."

Smaller Industries.—The old music of the loom and the wheel have long since ceased to echo through the hills of Bourbon county; the people, through the high prices of fine stock, have become too rich to wear homespun, yet a large quantity of butter, eggs, poultry, dried fruit, milk, and cheese is produced for home use and export.

Crops—With the richest average soil of any county in the State, except probably Woodford, Bourbon produces all kinds of cereals, tobacco, hemp, flax, blue grass, and other grasses in perfection. The strong soil necessary for hemp is found in every part of the county, and a peculiarity is, that the grasses grow as well among the trees as in the open field. The corn is very heavy, and possesses the property of making a very superior quality of alcohol and whisky. The rents of grass woodlands are often worth as much or more than the entire corn crops raised on the richest lands of the Western prairies.

Fairs and Agricultural Associations.—The "*Bourbon County Agricultural Society*" is the oldest institution of the kind in Kentucky. It was organized in 1838, and has held a fair every year since, unless probably during the civil war. Here has been exhibited the best stock in the

State. The fair week is a great holiday in the county, and everybody takes an interest in the exhibition, both of stock and other agricultural and mechanical products. The Granges are numerous, and have added much to the interest taken in the improvements of various kinds of crops. Trotting associations and breeding and importing associations or companies exist in the county.

BOYD COUNTY.

Boyd county, in the extreme northern part of the State, bordering on the Ohio and Big Sandy rivers, named for Col. Linn Boyd, was organized in 1860 out of parts of Greenup, Carter, and Lawrence counties, and is bounded as follows: North by the Ohio river, which separates it from the State of Ohio; east by the Big Sandy, which separates it from the State of West Virginia; south by Lawrence, and west by Carter and Greenup counties.

Geology and Minerals.—This county is located entirely upon the carboniferous rocks; and is one of the best coal and iron counties in the State. The surface of the country is broken, and the soil quite diversified. The bottom lands of the rivers and creeks are very rich, and the west and north sides of the hills and ridges are good lands, while the ridges and southern and eastern exposures of the hills and ridges are generally sandy and thin soil. Much of the country is too rocky for cultivation, but will do well for sheep husbandry. Several varieties of iron ores are found in almost every part of the county in quantities practically inexhaustible. Immediately adjacent to many of the iron ore deposits are strata of the finest quality of bituminous coal. The Eastern Kentucky coal field, which is an extension of the Pittsburg series, and which covers a large territory in Western Pennsylvania, extends over all Eastern Ohio and West Virginia into Kentucky, and through Kentucky along the table-lands of the western slopes of the Appalachian chain of mountains into Tennessee and Alabama. This is probably the largest continuous coal field in the world, and in East Kentucky alone covers a territory larger than the coal fields of England,

Ireland, Scotland, and Wales combined. No anthracite coal has ever been found in the State, but much excellent cannel, semi-cannel, and block coal exists, in beds more convenient for mining than any in Europe. The iron ores of Boyd can be reduced to iron as cheaply as in any other country, and the metal is of a very tough nature, and of a superior quality for all kinds of shop-work, bridge-building, steel, railroad purposes, or general use. Besides iron, there are some lead and other minerals in this county, but probably not in paying quantities.

Manufactures.—No county in the State presents better facilities for iron factories and furnaces than Boyd. Already there are in the "Hanging Rock Iron Region" in Kentucky, of which Boyd county is the centre, over a dozen large furnaces, running on what are popularly known as the limonite, block, and kidney ores. These ores in Boyd county vary from beds of one foot to fourteen feet in thickness; besides these, are local beds found at every furnace. The iron made from these ores is mostly hot-blast charcoal, but some furnaces now work cold-blast for the production of car-wheel iron. For general foundry use, no iron ores in the United States have a reputation for excellence superior to these. The Ashland or Coalton coal, a dry-burning, non-coking coal, is used in the furnace without any admixture of coke, and excels in quality any similar coal in the West. At Ashland and Cattlettsburg are several iron-works, forges, and nail factories, where the pig metal is put into blooms, bar iron, nails, &c., ready for use. In the near future this portion of Kentucky is no doubt destined to become the seat of great manufacturing wealth, and its vast supplies of coal and iron will give employment to a crowded, busy population. For further description, see volumes of State Geological Survey.

Timber.—This county abounds in the best quality of all kinds of timber indigenous to this latitude. Walnut, hickory, gum, poplar, beech, maple, oaks of every kind, pine, locust, hemlock, chestnut, ash, sugar-tree, buckeye, hackberry, black-jack, &c., all flourish and attain remarkable size. Saw-mills are numerous, and a large supply of lumber and logs is every year exported through the Big Sandy and Ohio rivers.

TOWNS AND VILLAGES.

Cattlettsburg, the county seat, is beautifully located on the west bank of the Big Sandy river, immediately at its junction with the Ohio. It has a population of nearly 1,500, and contains a fine court-house, several elegant churches, a dozen mechanic shops, good schools, and many nice residences.

Hampton City, adjoining Catlettsburg on the south, is a very neat village, containing several pretty residences.

Ashland, a city of nearly 3,000 persons, is one of the most thriving manufacturing points in the State, and is the centre of the coal and iron business of this section of the country. It is handsomely situated on the Ohio river, between five and six miles below Catlettsburg, and is the point at which the Lexington and Big Sandy Railroad first comes to the Ohio river. This road is completed sixteen to twenty miles from Ashland, and will ere long be finished to Lexington—the gap between Mt. Sterling, in Montgomery county, and Grayson, in Carter county, having already been surveyed. There are now several large iron establishments in successful operation in Ashland, and several millions of dollars invested in the iron, coal, and banking industries of the city.

Cannonsburg and Coalton are thriving villages, each doing a considerable local trade.

Domestic Arts.—The people of Boyd county are very industrious, and manufacture at home nearly all their wearing apparel, the women doing all of the spinning and weaving, while the men supply the flax, wool, and cotton. They also traffic largely with the local stores in jeans, linseys, blankets, home-knit socks, linen, poultry, eggs, honey, beeswax, maple sugar, molasses, and ginseng.

Fruits and Crops.—Wheat, corn, oats, and rye are the chief agricultural products. Tobacco, flax, and hay are raised in quantities sufficient for home use, but not much for export. Fruits of all kinds flourish well, and apples, peaches, pears, cherries, plums, and berries of all kinds seldom fail to produce a full crop. Chestnuts, haws, wild plums, wild grapes, hickory nuts, walnuts, and other native fruits, nuts, and berries, yield abundantly every year, while the acorn mast is so plentiful as to supply hogs with food during a large part of the fall and winter months. The large number of persons engaged in the coal and iron business creates quite a market for the excellent vegetables and garden farming products and fruits raised by the country people, and also for all the surplus hay, corn, bacon, and flour.

Schools and Churches.—There are excellent male and female schools and academies in Ashland and Catlettsburg, where the higher branches of a liberal education are taught. The common schools are taught in every district, and the people evince a greater desire for general education than at any previous time. There are several elegant churches in Ashland and Catlettsburg, and all the different denominations of Chris-

tians are represented. The Catholics, Baptists, Reformers, Presbyterians, Methodists, and Episcopalians are the most numerous. In the country the churches are less elegant in their style of architecture, but there is no less zeal among the members on this account, feeling, as they do, that true piety is always humble, and without show or vain pomp or ostentation.

BOYLE COUNTY.

Boyle county, named for Chief Justice John Boyle, was formed in 1842, from parts of Mercer and Lincoln, and is bounded on the north by Mercer, east by Garrard, south by Casey and Lincoln, and west by Marion county.

Geology and Soil.—This county is quite varied in its geological formation, beginning at the upper Cambrian or lower Silurian and passing through the upper Silurian, Devonian shales, to the knobby sandstones. The soil corresponds to the rocks, and runs from first-class hemp and blue grass lands up to the “crawfish” clays, and then to the sandy ridges or knobs. Fortunately, a large majority of the county is based upon the blue fossiliferous limestone, similar to that of Fayette and Bourbon counties, and very little of its territory in the southern part of the county is located along the great fault, which occurred when the lower Silurian rocks were raised on a level with the Waverly group and the sub-carboniferous limestones. This fault or great breakage of rocky strata of the more recent formations occurred, no doubt, simultaneously from Lewis county, Kentucky, around the eastern and southeastern and southern rim of the lower Silurian formation to where it crosses the Ohio river, below the falls, at Louisville, and then along through Indiana, and then into the State of Ohio, till it again reaches back to the starting point in Lewis county, Kentucky. This upheaving must have been many hundred feet, and probably was done so gradually as not to disturb the streams, which slowly washed out for themselves beds, as the overtopping strata were disintegrated and cleared off by the action of the rains and atmosphere from above the “Blue Grass Regions.” Ken-

tucky and Salt rivers and their tributaries give almost incontestable proof of this action. Of course it took almost endless periods of time to accomplish the great freaks in the geology of the country; but there is no other way that we can reasonably account for the face of the rocks as we now find them. About the line of this great cleavage ought to be considerable quantities of iron ores and black and grey shale or slate rich in potash; and before it is reached, we find some fine paint earths, all of which will be utilized in the future.

Crops.—The best quality of the lands formed by the disintegration of the blue shelly limestone will grow anything to perfection that is planted on it; but it is more peculiarly adapted to the growth of *hemp, corn, and blue-grass*. Here stock of all kinds can find an abundance of everything that is needed to make perfect bone, perfect muscle, and perfect adipose tissue. Like Bourbon, Fayette, Madison, Woodford, and other similarly geologically located counties, all the central and northern part of Boyle was intended by nature for hemp, stock, and good whisky. Other crops do grow and do well, but hemp, corn, and blue-grass are specialties. Vineyards would pay if the hardy native vines, Concord, Ives Seedling, &c., are used, and lands in the south of the county would excel in orchards, as well as in vineyards and sheep husbandry. On account of its proximity to "the knobby hills," Boyle has but few good mill streams and no navigable waters; therefore we find her people a stock-raising, agricultural population, instead of being engaged in large factory enterprises or commercial ventures; and they have so far succeeded that their county is now one of the most wealthy, intelligent, and flourishing in the State. To keep the soils in good heart chemical fertilizers, nitrogen, potash, and phosphoric acid, must be used on the lands just before the crops are planted, or sown broadcast over the meadows when they begin to show signs of decadence.

TOWNS AND VILLAGES.

Danville, the county seat, is beautifully located about the centre of the county, on a handsome plateau of naturally level meadow land. It contains a population of about 3,000 persons, noted for their intelligence, hospitality, refinement, and energy. Nowhere in America is there a superior people to these in noble manhood and superior mental and physical development. Centre College, Danville Collegiate Institute, Caldwell Female Institute, and the Kentucky State Deaf and Dumb Asylum, besides other good schools, make this place a literary centre, from which sprays of science and learning are scattered all over

the adjacent country. Danville has an elegant court-house and other necessary public buildings, eight or ten fine churches, several banks, many large stores, and numerous superb private residences. It also has large mills and wagon and carriage factories, iron shops, agricultural implement works, and scores of other smaller mechanical shops.

Perryville, nine miles west of Danville, is a place of large local trade, with a population of over five hundred persons. It contains several fine churches, and many handsome private residences, and good school-houses.

On the Lebanon Branch of the Louisville and Nashville Railroad are several railroad stations or villages, with thrifty populations and large local trade. Of these, *Shelby City* is the largest, about four and a half miles from Danville, and the depot at which Danville does her shipping. This place has now more than four hundred people, and is growing rapidly. Several large stores and groceries have stimulated a large barter traffic with the adjacent country.

Parkersville, the next largest, has several stores and groceries, shops, and taverns. Its population is over two hundred.

Alicton, *Brunfield*, and *Mitchellsburg*, are all pleasant, thriving villages, each doing a good commercial business.

Schools, Colleges, and Academics.—*Centre College* was chartered in the year 1819, and is one of the oldest and most noted institutions in the Ohio Valley. It has a productive endowment of \$170,000, and an additional of \$80,000. It has beautiful grounds and good buildings, immediately within the limits of the town of Danville. The library contains some 8,000 volumes of well selected books. The chemical and philosophical apparatus is valued at over \$3,000. Some 125 students now attend this institution, of whom more than one third receive gratuitous tuition, and one sixth rooms free of rent. The faculty consists of eight members, acting under the auspices of the General Assembly of Presbyterians. O. Beatty, LL. D., a gentleman of fine attainments, is President.

The "Danville Classical and Military Academy" was chartered in 1874, with power to grant certificates of proficiency and diplomas in special branches, and to confer degrees. It is governed by a board of seventeen trustees, and has a corps of fine instructors. The associate principals are Professors Charles H. Winthrop and J. L. Ford. At this institution are about one hundred students, who are regularly drilled in military tactics, after the fashion of the West Point cadets. The disci-

pline and drill, as well as the curriculum of studies, are well planned and ably conducted by the faculty, which is composed of highly educated gentlemen, well skilled in teaching.

Caldwell Institute, a chartered female college, has a building worth \$80,000; confers degrees, and presents a fine curriculum of studies. It has an able corps of teachers, and is largely patronized by Boyle and the adjacent counties.

"The State Institution for the Deaf and Dumb" is located at Danville; it was established in 1823, and has been in successful operation for more than a half century, dispensing blessings to those afflicted with the privation of hearing and speech.

The officers directly intrusted with the care of this institution are a principal, physician, matron, and steward. The principal and his faculty devote themselves chiefly to the mental and moral and manner-culture of the pupils. They are all skilled in the peculiar art of instructing mutes, and have been selected with an eye single to their mental and moral endowments for the talent-exacting work they are required to perform.

The session begins on the first day of October, and closes on the 15th day of July. The vacation-period, therefore, includes two months and a half of vacation, thus giving the pupils ample opportunity to visit their friends. Every deaf-mute in Kentucky, of sound mind and body, is privileged to receive all the benefits of this institution, without charge for board or tuition, for a term of seven years. The branches of study pursued are reading, writing, arithmetic, grammar, geography, history, natural history, physiology, the Bible, etc.

Guardians or parents of deaf-mutes wishing to place them in the institution should address J. A. Jacobs, principal, Danville, Kentucky. Prof. Jacobs is the author of several text-books, designed for mutes.

Besides these, there are several other good private schools in the county, where the higher branches of studies are taught.

The common schools of the State are taught in every district, and no child is debarred from the benefits of a good common education, unless by the obstinacy or ignorance of its parents.

Railroad Facilities.—The Knoxville Branch of the Louisville and Nashville Railroad runs through this county, and affords daily communication with all parts of the West and South. The Cincinnati Southern Railroad, now completed nearly to the Tennessee State line, runs from north to south through Boyle county, and places every neighbor-

hood in close connection with Cincinnati on the north, and Chattanooga, Tennessee, on the south.

Smaller Industries.—Formerly every family in Boyle manufactured all the “homespun” cloth that was used for clothing its members. Then the cards, the spinning wheels, and hand-loom were popular institutions about the house. But pride has long since banished these good old family relics, and now it is rare to find a woman who is accomplished in their use, and many of the younger belles would not know what the implements were made for if placed before them. The high price of blooded stock, the rich lands, and railroad customs, now prevalent, have combined to destroy the lesser factory business of the old homesteads, but there is still much riches gathered in by the country people through the sales of home-made sugar and molasses, feathers, honey, beeswax, poultry, eggs, and butter.

Live Stock.—Boyle is one of the best stock counties in the State, and has become justly famous for her fine horses, cattle, sheep, and swine. Nowhere on the continent can better blooded stock of all kinds be found than in this county, and nowhere are seen more luxuriant fields of bluegrass and Indian corn upon which to feed and fatten this stock. “Horse-talk” is as fashionable here as it is in Fayette, Bourbon, and Woodford, and a man who does not have at his finger’s ends the pedigrees of the chief racers, trotters, and short-horns is considered poorly educated. Probably no part of the American continent is better adapted to bring all kinds of live stock to a perfect development than parts of Boyle county.

The Population is highly intelligent, refined, and hospitable, and are anxious to welcome all new-comers to share with them the great agricultural resources which nature has so bountifully bestowed on this favored land. The original settlers were generally from the best families of Virginia and North Carolina, and their descendants have lost none of the excellencies of the people of those good old States.

BRACKEN COUNTY.

Bracken county, named for Bracken creek (which was named for Wm. Bracken), was taken from parts of Mason and Campbell counties in 1796, and is bounded on the north by the Ohio river, which separates it from the State of Ohio, on the east by Mason, south by Robertson and Harrison, and west by Pendleton county.

Topography and Geology.—Bracken is located on the northern border of the State, from thirty to fifty miles above Cincinnati, and is generally a high rolling country. It is based altogether upon the lower Silurian group of rocks, but owing to the different stratas of thin rocks which come to the surface, and give character to the soils resting upon them, the lands of Bracken vary greatly in different neighborhoods. All the eastern part of the county has a similar soil to that of the western part of Mason county, while further west the mudstone of this group gives entirely different characteristics. Each of these classes of lands produce excellent fancy tobacco, the eastern part the fine wrappers known as "Mason County Tobacco," and the western the best quality of "Cutting Leaf." Wheat and corn will grow well in any part of the county, although an addition of land plaster, sulphate of ammonia, sulphate of potash, and dissolved bone-dust will add greatly to the production of any kind of crops on the older and worn lands. Ashes and salt, or the German kainit and superphosphates, will also greatly improve these lands for wheat, corn, and tobacco.

There are no minerals in workable quantities in any part of the county, although good mineral waters are found in several places, which probably take their origin in the calciferous sandstones several hundred feet below the top rocks. The silicious mudstone, and also the calcareous limestone formation of the Silurian epoch, each gives a soil well adapted to the production of fruits, vegetables, cereals, and tobacco; and, where the proper locality is presented, afford fine land for vineyards. On the eastern and southern slopes of the hills very fine wine-producing grapes can be grown, provided good, hardy native stocks are used. The Concord, Ives Seedling, Delaware, and Hartford Prolific would no doubt do well, and yield largely, while foreign varieties, or even the tenderer native vines, as the Catawba, for instance, might not answer

so well. The best tobaccos are grown on the oak lands, while the river bottoms far excel all others in corn, but generally fail in wheat, on account of the rust. Bone-dust and kainit greatly remedy this evil on any lands, and particularly on rich bottoms, by affording glazing matter for the stalks; salt alone, two bushels to the acre, would be of great benefit.

TOWNS AND VILLAGES.

Brooksville, a handsomely located town, of some 400 inhabitants, the county seat, is situated nearly in the centre of the county. It contains a fine brick court-house and other public buildings, several churches, a handsome academy, and many elegant residences.

Augusta, the former capital of the county, is nine miles north of Brooksville, on the Ohio river. Its site is one of the most imposing on the Ohio. Its history is one of the most noted of any town in North Kentucky, having in early times been the scene of several Indian fights, and a battle-ground during the late civil war, and the first place in the world where the Methodist Episcopal Church established a college, and also the birth-place and residence of several of the most noted men in the ecclesiastical and political history of the State. It has now about 1,000 inhabitants, and does a large local trade in tobacco and other products of the county. It contains several elegant churches, the old Augusta College buildings, tobacco factories, and many handsome private residences.

Germantown, a flourishing town of some 400 people, is on the line of Bracken and Mason counties, six miles from Brooksville. It has a number of stores, and does a large local trade.

Foster, on the Ohio river, some ten to twelve miles below Augusta, is a considerable shipping point, with a population of over 200.

Berlin and Milford, beautiful villages, the former in the western and the latter in the southern part of the county, have some 150 population each, and are thrifty and enterprising points for business.

Schools and Churches.—The public school system of the State works well in this county; over fifty public schools are taught. There are some thirty school-houses newly built in the county, at a cost of from \$600 to \$1,500; and the one at Augusta cost nearly \$5,000; the others are all comfortable, and will soon be replaced by modern-built houses. The people take great interest in these schools, and nearly all the children of the county now are able to attend school at least five months in the year. Besides the public schools, there are many private institu-

tions, high schools, academies, and seminaries. At Augusta are the Augusta College buildings, formerly a Methodist college, with a large patronage, until it was burnt down. Having been rebuilt, it is now used as a female academy.

The Smaller Industries.—The proximity of Newport, Covington, and Cincinnati gives Bracken county great facilities in disposing of all the surplus products of the farms, vineyards, and gardens, and stimulates the people to exert their best skill in producing all kinds of vegetables, fruits, live stock, poultry, eggs, feathers, butter, &c., &c. These, in addition to the whisky distilled and the tobacco sold and manufactured, yield a fine income each year to all engaged in agricultural or horticultural pursuits. The old plan of manufacturing cloth from flax, cotton, hemp, and wool has nearly disappeared; and, instead of homespun clothing, Eastern factory goods are almost exclusively used. There are few streams of sufficient importance to give water-power for factories and mills; consequently, the people do not engage much in any other industries than farming and gardening.

Live Stock.—A great deal of fine stock is raised in this county, particularly horses, mules, and cattle, which find a ready market at home or in Cincinnati. Sheep do well, and, but for the intrusion of dogs, would be much more numerous. Excellent poultry has been introduced into the country, which now afford eggs and fowls in great numbers for the markets of Newport, Covington, and Cincinnati, and the boats that ply the Ohio river.

BREATHITT COUNTY.

In the year 1839 Breathitt county was carved out of Clay, Perry, and Estill, and named for Governor John Breathitt. Since 1839, the State has clipped this county on every side, in making new counties, until now it is next to an impossibility to tell its shape, size, or boundary. As near as can be represented, it is about the form of a saddler's crescent leather-cutter. It is bounded on the north by Wolfe, Morgan, and Magoffin counties, east by Magoffin, south by Perry, and west by Owsley and Wolfe.

Geology and Soil.—The entire surface of this county overlies the carboniferous formation, and, like other portions of the eastern coal fields, is quite hilly. Coal and iron ore can be found in almost every part of the county. These coals are generally found above the conglomerate, and correspond to similarly located beds in the western coal field of the State. The most interesting features in the geology of this part of the county are the numerous outcrops of cannel coal to be found along the beds of the creeks and near the foot of the hills. This strata of cannel coal is from 30 to 50 inches thick, and of excellent quality. There is also another bed of cannel coal, the upper 14 inches of which is cannel, lies high upon the hills, and is probably the equivalent of No. 11 coal of the western coal field. The beds of bituminous coal, throughout the county, are generally of workable thickness and good quality. The mines of Jerry South & Sons, and Mr. Cardwell, near Jackson, if properly worked, could alone supply coal for all the towns on the Kentucky river. Iron ores overlie the sub-carboniferous limestones here as elsewhere; but as these lie deep, nature seems to have furnished other beds more convenient to the coal strata, as if just to allow the iron-master to accomplish his ends with the least possible labor. The great abundance of iron ores and coal must some day, in the no very distant future, fill this county with furnaces and rolling-mills.

The soil is rich on the river bottoms and hollows, and in some places on the hills, wherever it is based on a rich red clay; but where this clay is yellow, or the sand greatly predominates, or the rocks are too near the surface, the soil is thin and unproductive. There are several springs and wells of salt water sufficiently strong to pay profit to salt manufacturers. The mineral waters (sulphur and chalybeate) in this county are no doubt excellent for many chronic diseases.

Timber.—The forest growth is as yet almost untouched, and exists in an unlimited supply; oak, poplar, locust, butternut, walnut, hackberry, black-jack, sycamore, sugar-tree, pine, and gum are to be found everywhere, and in quantities and qualities that will justify their shipment even to the markets of Europe.

Crops.—Corn, wheat, oats, rye, buckwheat, flax, and tobacco grow well on the richer grades of lands. Fruits of all kinds do well, and most of the domesticated grasses yield abundant crops. The uncertainty of navigation in the streams flowing in the Kentucky river, and the great distance from markets, have tended greatly to prevent the advancement of agricultural pursuits in this section of the State.

The country is particularly adapted to sheep industry, and will no doubt, when the dogs cease to be so destructive, and the finer breeds of long fine wool sheep are introduced into the country, be one of the best wool-growing provinces on the continent. Wine-making, also, could be made most profitable, if vineyards were planted on the eastern and southern slopes of the hills, and well attended to. The best varieties of grapes, no doubt, would be the native stocks that are hardy and prolific, such as the Concord, the Delaware, the Hartford Prolific, the Ives Seedling, and probably the Catawba. No part of the world is better adapted to raising bees than Breathitt county, where honey can be made a crop that would amply repay every attention given the apiary.

TOWNS AND VILLAGES.

Jackson, the county seat, is handsomely located near the junction of the Quicksand and South Fork, about the centre of the county, and contains a population of about seventy-five to eighty persons. This place will be made quite a manufacturing and trading point when iron furnaces are introduced in that section of the country, which must be done after awhile. *Strangerville* is seven miles south, and *Crockettsville*, fifteen miles southwest of Jackson; they are small, well-located villages, conveniently situated, near endless supplies of timber, coal, and iron ores.

Water power.—The streams of this county afford good water-power, either for factories or mills, with timber, stone, coal, and iron ores in abundance. Such streams, and such minerals and woods, in any one of the European countries would command fabulous prices, where here in their great abundance they are scarcely appreciated, although they may become things of untold value.

Schools and Churches.—The public free school system is in general use in this county, and a school taught in each district, at which the children are educated in the different branches usually studied in these schools. The public interest is rapidly increasing in regard to education, and much good has resulted from the training now given to the youth of the country, and a general spread of intelligence is manifesting itself among the younger class of the population.

The Methodist and Baptist denominations are the most numerous, although other Christian churches have members scattered throughout the county.

Domestic Arts.—The spinning-wheel, the flax-wheel, and the loom are still used generally among the industrious, energetic citizens of Breathitt, and thousands of yards of the best quality of jeans, linsey, flax-linen, and cotton cloth are made at home by the female portion of the population. Butter, milk, eggs, chickens, ducks, turkeys, and honey in abundance for home consumption, are produced on the small farms; but little is sold outside of the county, owing to the want of easy transportation. There is no talk of "hard times" among the people, who are honest and intelligent, and not ashamed to work, and who have a good old homely motto which they practice on all occasions, "pay as you go." There is fine sport fishing in the streams and hunting game among the hills, where deer, foxes, raccoons, wild turkeys, &c., abound.

BRECKINRIDGE COUNTY.

Breckinridge county, in the year 1799, was formed from a part of Hardin, and named in honor of Col. John Breckinridge. The Ohio river, which separates it from Indiana, bounds this county on the north, Hardin county lies on the east, Grayson on the south, and Hancock on the west.

Geological Features.—The face of the country is generally high and rolling, with some large tracts of those level "barren lands" so peculiarly adapted to the growth of wheat and tobacco. The rock foundation is nearly altogether sub-carboniferous limestone, except on the western part, where this series passes under the carboniferous. Here are found excellent cannel and bituminous coal, and some specimens of lead have been discovered. The top soil is comparatively thin in places, although there is a large majority of rich lands, which are underlaid by a rich ferruginous red clay, possessing most of the mineral elements needed for plant food. Deep plowing, and green crops plowed under, would materially improve the soil in every part of this county, as also will the addition of land plaster, marl, German kainit, salt, ashes, and dissolved bone-dust. The limestone formation presents many strata of fine build-

ing rock, as well as that suitable for hydraulic cement or plasterer's lime. The soil of Breckinridge was made by the disintegration of these rocks, and as they were not so rich in fossils as those of the Blue Grass Region, of course the lands do not contain such an abundance of the mineral elements and calcareous matter, yet they are rich enough to produce fine crops of cereals, tobacco, flax, and most of the grasses, and all kinds of fruits and garden vegetables. The timber is ample in supply for all the needs of the country; and since fire has been kept from burning the native grasses, the "barren growth of timber," consisting of black and red oaks, post oak, white oak, hickory, wild cherry, dogwood, &c., has rapidly taken the place of the barren grass, and make an ample supply of wood and rail timber for home use.

TOWNS AND VILLAGES.

Hardinsburg, beautifully located about the centre of the county, is the seat of justice, and contains a highly intelligent and energetic population of five hundred persons. It has a first-class court-house, and other necessary public buildings, splendid churches, fine school-houses, and many handsome private residences. *Stephensport*, situated on the Ohio river, is a place of considerable trade, and contains a population of about two hundred. *Cloverport*, ten miles below Stephensport, is the largest town in the county, contains about one thousand people, and is the shipping point for a large portion each of Breckinridge and Hancock counties. It has a very energetic and thrifty population, and is, no doubt, destined to become a place of great commercial and manufacturing importance. *Union Star*, also on the Ohio river, a few miles above Stephensport, is a point of considerable trade, and contains a population of about one hundred and fifty. Besides these towns, there are several thriving and pleasant villages—*Webster*, *Cross Roads*, *Hudsonville*, *Constantine*, &c., &c., all doing a good local business.

Streams.—The Ohio river, which is the northern and western boundary of the county, affords uninterrupted navigation at all seasons of the year. Sinking creek, Rough, Clover, and North Fork of Rough creek, are the principal streams, each of which affords good sites for factories and mills, and run sufficiently low in the limestone formation to thoroughly drain the more level lands. The cavernous limestone gives passage to many subterraneous springs and creeks, which occasionally sink and rise many times within the distance of a few miles. Along their entire subterraneous courses are caverns most beautifully worn out of the solid rocks, chambers of immense size, connected by long

avenues, beautifully frescoed with incrustations of the carbonates and sulphates of lime.

Crops.—Tobacco, corn, and wheat are the chief staples, although oats, rye, barley, hay, and various kinds of fruit, are extensively raised by some farmers. The planters here, like those in other portions of the State, have not given sufficient attention to the rotation of crops or to scientific fertilization of their exhausted lands. The system practiced by most farmers is, corn and tobacco followed by the same next year, or else by wheat, and sometimes a little rye or oats takes the place of wheat, then corn and tobacco, and so on until the land is exhausted. The land is usually broken up with two horses or mules, sometimes with only one, and much skimming is done in the cultivation of the crop. Of course this loses all the advantages of the rich mineral matter in the stiff red clay subsoil, and soon forms a hard slick pan, below which the roots of the plants can never go. Subsoiling is practiced to a very limited extent, and under-drainage by tiles has not been practiced at all. See article on fertilization.

Live Stock.—But little attention has been paid to fine breeds of stock in this county. Almost every farmer has horses, mules, cattle, hogs, and even sheep, which he lets run wild as far as the range will permit, or, if he confines them to his own pastures, he little cares whether they are of the best pedigrees or only of the "common scrub;" in consequence of which, the stock of the county does not rank so high as they are entitled to do, when we consider the energy of the people and the productiveness of the lands in corn, grass, and hay.

A few of the most enterprising farmers, however, are beginning to introduce better bloods of horses, cattle, hogs, and sheep, and no doubt, in a few years, Breckinridge will rank among the best stock-raising counties outside of the "Blue Grass Region" proper.

Schools and Churches.—The public school system generally prevails in this county, at least so far as to have schools taught in nearly all the districts for four or five months in the year. Besides these, there are several private schools and seminaries in the county, and good male and female academies in Hardinsburg and Cloverport. The Primitive Baptists, the Missionary Baptists, the Methodists, the Reformed Christians, and Presbyterians form the most numerous Christian denominations, although there are a number of Catholics, Episcopalians, and Unitarians in the county.

Domestic Arts.—The farming portion of the community still manufacture more or less of the common wear, using cotton, wool, and flax

of home production. They also raise an ample supply of chickens, geese, ducks, turkeys, and guineas to give them eggs and feathers for home consumption, and some for trade. Honey could be made very profitable, but as yet the people have none of the improved Italian bees, and but few families keep even hives of the common bee. Dried fruit is sold to some extent, and some few grapes are raised for home use, but as yet none for market or wine, although the eastern and southern slopes of the hills are well adapted for vineyards on a large scale, which would prove more profitable than any crop grown.

BULLITT COUNTY.

Bullitt county, named for Col. A. S. Bullitt, was taken from parts of Jefferson and Nelson counties in 1796. It is bounded on the north by Jefferson, east by Spencer and Nelson, south by Nelson and Hardin, and west by Hardin, the Ohio river, and Jefferson.

Geology and Soil.—The geological formations of this county are exceedingly varied, beginning with the upper Silurian as the lowest, then the Devonian, Lingula Shale, Waverly Group, and sub-carboniferous sandstone. The northeast part of the county is located on the Silurian, and the formations vary as they advance towards Hardin county. The face of the country is "knobby" and rolling in parts, and in other portions flat, wet, or craw-fishy. There is much good land, and some very inferior, dependent on the formation. The knobs are capped with sub-carboniferous sandstones, on which pine trees grow quite freely. Below these are the different kinds of shale and limestone, in which are found two or three kinds of iron ores in considerable quantities. The black Devonian shale exhibits a large per centage of potash (from 5 to 7 per cent.), and could be used profitably on the exhausted lands. The lands generally of this county are acid or "sour," and would be greatly improved by sowing over them lime or land plaster, the German kainit, and dissolved bone-dust. The iron ores of this county are found in that shaly formation, that differs in thickness from 75 to 150 feet, and

which also is the source of the "bitter water," from which salt was made in the first settlement of the country.

The soil, formed by the disintegration of the coralline limestone, similar to that of Jefferson county, is the best in the county. Beneath this, in the northeastern part of the county, are marls which might be of advantage to the worn land, but their value is greatly decreased by want of the phosphoric and sulphuric acids, which make the South Carolina marls so valuable. Ashes are an excellent fertilizer for these lands, and in many localities subsoiling would prove advantageous, and in nearly every section under-drainage by tiles would add much to the productive capacity of the flat lands. If any lead ore exists near the surface, which is probable in the Silurian formation, it is not enough to be worked with profit. No county in the State can be improved more than this by chemical fertilizers and tile-drainage.

TOWNS AND MANUFACTURES.

Shepherdsville, the county seat, at the crossing of the Louisville and Nashville Railroad over Salt river, has a population of some 300 persons, with a good court-house, several fine churches, and many neat residences. Its business is local, without much pretension in regard to manufacturing enterprises, although its situation is good for this class of industries.

Mt. Washington, some ten miles northeast of Shepherdsville, is a place of large local trade, with a population of about 400 people.

Pittspoint, at the junction of Rolling Fork with Salt river, has a population of 125 persons, and is also a place of fine trade, and quite prosperous. Along the railroad are several neat villages, which supply dry goods and groceries to the people of their respective neighborhoods, and ship the surplus from their farms to the Louisville market; these are *Bardstown Junction*, *Mt. Vitio*, *Cave Spring*, *Belmont*, and *Lebanon Junction*.

Rivers.—Salt river passes centrally through this county, and, with its tributaries, drains every part of it. The Rolling Fork, which empties into Salt river, is the southern boundary for some distance. There are on these streams several fine sites for mills and factories, with water enough to run them all the year; in fact, Salt river has water enough to be made a fine slack-water navigable stream by a proper system of dams and locks.

Manufactories.—Formerly there were several salt-works in this county, which, however, are not now active. The iron interest has been

partially developed, a furnace or two being in blast, which make the very best quality of tough, soft iron. Other enterprises of the same kind could be profitably located in the knobby regions of the county. Excellent locations could be selected for cheese factories, and for canning fruits of all kinds, as the lands of this county are well adapted for orchards and vineyards.

Smaller Industries.—Owing to the proximity of the city of Louisville, the farmers of Bullitt county are compelled to engage in those classes of business that will furnish the daily markets with supplies. Orchards, vineyards, and gardens will eventually occupy a large portion of the territory, while dairies, bees, poultry, and fish will be found most lucrative sources from which can be derived the wealth of the population. Fortunately the great variety of soil, and the peculiar formation of the hills and valleys, are promotive of these very industries: grapes and peaches will do well upon the hills, and with proper mineral fertilizers and tile-drainage, the sour, level, spongy soils can be made equal to any garden lands in the Union. Vineyards planted on the southern and eastern slopes of the hills and ridges ought never to fail in grapes, provided the hardy American stocks are used, such as Concord, Ives Seedling, Delaware, Hartford Prolific, Catawba, &c. Similarly situated soils in Tennessee have produced over ten thousand pounds of good Concords to the acre, from which over seven hundred and fifty gallons of wine can be made, with a body and bouquet much superior to the wines of Missouri or Ohio. Bees (Italian are best) and poultry can be made more profitable than any other branch of farming; and, on account of the ever ready market at Louisville, within an hour's railroad travel, eggs, fowls, and honey may be reckoned as cash articles, and as staple as tobacco or wheat. Small fruits, berries, and nuts also can be made to pay largely, and supply a healthy marketing, which can never be over-stocked.

Mineral Springs.—Sulphur, chalybeate, and salt springs and wells are found in many localities. *Paroquette Springs*, near Shepherdsville, is a place of great resort by the people of Louisville, Jefferson county, Bullitt county, and by invalids and pleasure-seekers from abroad. The waters of these springs are said to be very fine for many chronic diseases, as well as for intermittent fevers. There are other springs in the same formation which no doubt will some day be equally as much esteemed.

Education and Religion.—The people of Bullitt county are intelligent, educated, and refined, and are beginning to feel the necessity of a fur-

ther advance in scientific attainments, in order to fully enjoy the advantages of their proximity to the metropolitan city of the State. The common schools are taught in nearly all the districts, and several private schools and academies of higher grades are patronized by students desirous of a more advanced or classical education. The morality of the country is excellent, and the churches are generally well attended. The leading denominations are the Baptist (Primitive and Missionary) the Methodist, the Presbyterian, the Reform Christian, and the Catholic. A few Episcopalians, Unitarians, and Universalists are scattered over the county. There are many elegant church buildings, and the preachers' salaries are punctually paid.

BUTLER COUNTY.

Butler county, named for General Butler, of Pennsylvania, was taken from Logan and Ohio counties in 1810, and is bounded as follows: North by the counties of Ohio and Grayson, east by Grayson, Edmonson, and Warren, south by Warren and Logan, and west by Muhlenburg and Ohio.

Geological Formation.—This county is mostly based on the carboniferous rocks, although the southern part is of the sub-carboniferous limestone. Green river divides the county into North and South Butler, and gives, moreover, a very large amount of rich bottom lands, most of which is subject to overflow during the high rises of the winter and spring months. The face of the country away from the bottom land of the rivers is hilly, and in many places broken and abrupt, though the southern part, based on the cavernous limestone rocks, is a high level plateau, dotted with basins or "sink-holes" similar to those in Logan and Christian counties. The creek bottoms and level "barren lands" are rich and very productive, while the ridge lands, particularly those north of Green river, are generally poor. The finest, or among the finest, beds of coal in the West Kentucky coal field are found on Mud river, and in other parts of Butler county. Iron ores without limit are found in this county, connected with the coal measures. This ore is

either in layers, in nodules, or in ferruginous honeycomb sandstones, or iron-stones, and is either of the black band or hydrated peroxide of iron. The interlacing of the coal and iron beds will, at some future day, enable iron-masters in this portion of Kentucky to produce pig metal and blooms at cheaper rates than can now be done at any place in Europe.

Streams.—Green and Barren rivers, never failing navigable streams, afford constant water-carriage for all the agricultural productions, coal, minerals, and timber of this county, while their tributaries supply many fine sites for factories and mills. Few counties in Kentucky have better water-power, or more of the raw materials supplied by nature to give employment to numerous factories, mills, and other mechanical industries. Probably handsomer navigable streams than Green and Barren rivers, as they appear in Butler county, cannot be found on the globe, or rivers more constant in their supply of water, this latter being caused by the immense number of springs that supply them, which take their source from the cavernous streams of the sub-carboniferous rocks.

Timber.—No part of the western country is better supplied with timber of every kind than Butler county. In soft wood there are the tulip-tree or poplar, the sweet gum, black gum, linn, bass-wood, wahoo, buckeye, papaw, &c., &c., and in hard wood are white oak, bur oak, post oak, swamp oak, Spanish oak, black oak, chinquapin oak, chestnut oak, red oak, chestnut, hornbeam, ironwood, black and white walnut, cypress, wild cherry, sugar maple, birch, beech, hemlock, white and red elm, box-elder, mulberry, sassafras, black locust, honey locust, cedar, dogwood, holly, and various other trees suitable for useful timber and fuel. Large unbroken forests, of the best and largest trees of each species, can be found upon land of a mere nominal value, which in any of the European countries would bring almost fabulous prices. Their very abundance is a drawback, and in the "clearings" each year millions of feet of the best of timber is drawn together by oxen and with handspikes, and wantonly burnt, the owners little thinking that the balance of the world is suffering for the very treasure they are here ruthlessly destroying.

Crops and Stock.—The bottom and level uplands produce large crops of corn, wheat, tobacco, oats, and hay, while the hill country is blest every year with the best of apples, peaches, grapes, and other crops. Vineyards might be cultivated on the eastern and southern slopes of the hills and ridges to great advantage, and the Concord, Ives Seedling,

Hartford Prolific, Delaware, Catawba, and other native grapes, will no doubt here give yields of berries and wines equal to those of the most favored countries of Europe. The stock of horses, cattle, sheep, and hogs have not been so greatly improved here as in some other counties in the State, the people seeming to prefer the good old-fashioned scrub stock that can make their own living upon the native wild grass and oak mast, when it hits well, and at other times that can learn to live without being fed, except a few days in midwinter, and whose hides are impervious to the bleak rains and snows, or the whistling winds of any season. But a few enterprising farmers are beginning to introduce better pedigrees of all classes of stock, and we hope in a few years to see Butler rank among the foremost counties of the State in good pedigrees.

TOWNS AND VILLAGES.

Morgantown is handsomely located on the south side of Green river, about the middle of the county, and contains a population of about two hundred persons. It has a very good court-house and other public buildings, a fine school-house, and good churches. Twelve miles below Morgantown, at the intersection of Mud and Green river, at Lock No. 3, is Rochester, a place of considerable trade in tobacco, coal, dry goods, and groceries. At Lock No. 4, six miles above Morgantown, is Woodbury, on the south side of Green river, a handsome town of about 200 population, which does a large trade in lumber, staves, tobacco, and home productions of the smaller farms. Besides these, there are several pleasant villages, doing a good local trade. Of these, *Forgyville*, *Harreldsburg*, and *Sugar Grove* are on the south side of the river, and *Aberdeen*, *Flowersville*, and *Reedyville* are on the north side.

Schools and Churches.—The public school system of the State is well organized in Butler, and teachers employed in nearly every district. The "*Germantown Normal School*," located at the county seat, is an excellent institution, under the charge of W. J. Finley as principal, who manages the institution with ability. Here, in addition to the higher branches, are taught, to those desiring to learn, the best ways and methods of conducting and teaching the common schools of the country. There are also other good private schools in the county, where the higher grades of studies are taught. The principal denominations of Christians in this county are the Baptists (Hard-shell and Missionary), Methodists, and Reformed Christians. There are but few of other denominations.

CALDWELL COUNTY.

Caldwell county was organized in the year 1809, and named in honor of General John Caldwell. It was taken from a part of Livingston county, and is bounded north by Crittenden and Hopkins, east by Hopkins and Christian, south by Trigg and Lyon, and west by Lyon and Crittenden counties.

Geological Formation.—The greater portion of this county is based upon the sub-carboniferous limestone, and is a high level plateau, abounding in hollows or sinkholes like those in Christian and Logan counties. Some of the northern parts of the county are hilly and rocky, and passes from the cavernous limestone to the Chester Group, terminating in the southeast in the coal-bearing series of the West Kentucky coal measures. Wherever the lands are level, they are very rich, as is the case about Fredonia, along the railroad below Princeton, bordering on Eddy creek, and along the southeastern part, and in the level parts of the north and northwest portion of the county. Coal measures outcrop along the Tradewater hills, and some veins of lead have been discovered in the limestone series. These lead ores contain a quantity of silver, but probably not enough to pay for extracting it. Only trial pits have been dug in search for lead, no one having as yet gone regularly into the business of mining. The top soil is generally a rich vegetable mould, with an excellent, compact, red clay sub-soil, the latter containing most of the mineral elements needed as plant food. This clay, turned up with large plows, and exposed to the atmosphere, makes fine soil, and when well mixed with the top dirt, seems to give additional rich qualities for the production of corn, wheat, and tobacco.

When worn, these lands can be greatly improved by clover, peas, buckwheat, spurry, or rye turned under in the green state, and also by having sown over them at planting time a compost consisting of land plaster, ashes, salt, and bone-dust. German kainit and sulphate of ammonia, also sown broadcast, will greatly add to the yield of all kinds of crops. There are quarries of very good building marble, and also lithographic stone in Caldwell.

TOWNS AND VILLAGES.

Princeton, the county seat, having a population of about one thousand two hundred persons, is located on a beautiful plateau, surrounding one of the finest springs in the State. The Louisville and Southwestern Railroad passes through the town, affording quick and easy conveyance

to all parts of the country. The court-house is one of the best in the Green river country. The churches are elegant; the college buildings of the Princeton College, and also of the female academy, are handsome and commodious, and many of the private residences neatly and fashionably built. *Fredonia*, twelve miles northwest of Princeton, is quite a handsome town, doing a large local trade, and surrounded by a rich country, and a prosperous community of farmers. Its population, of about two hundred persons, are intelligent, enterprising, and thrifty. *Scottsburg*, *Dulaney*, and *Farmersville* are thriving villages, each doing a considerable trade in their respective neighborhoods.

Manufactories and Trade.—*Princeton*, as the central point of Caldwell county, is most excellently located to become a place of extensive manufacturing enterprises. It has already one woolen factory, two or three manufacturing flour mills, as many wagon and plow shops, and more than a dozen other mechanic shops. The large creek, bursting out in the very heart of the town, affords water for any number of factories to be run by steam, with fuel that can be delivered here cheaper than it can be procured even in Pittsburg, Pennsylvania. The coal mines, immediately on the railroad, a few miles from Princeton, can easily supply any amount of fuel needed to factories located at that point (without rehandling) at the doors of their furnaces. Hard and soft timber abound in every direction; iron ores without limit are in the neighborhood, immediately on the railroad; tobacco, cotton, flax, corn, wheat, and barley grow up to the very edge of the town, and labor can be supported as cheaply as at any other place in the United States. The only things needed are capital and skilled labor, which no doubt will gradually accumulate at this point, and make it a place of considerable manufacturing and commercial importance. The trade of *Princeton* will go hand in hand with its mills and factories, and the rich lands of the farmers will advance in price with the general prosperity and growth of its manufacturing centre.

Schools and Colleges.—*Princeton College*, one of the oldest literary institutions in the State, was established in 1826 by the then new denomination of Cumberland Presbyterians, and flourished for many years, when it was partially removed to Lebanon, Tennessee. Within the last few years it has been started again, under auspices that seem to warrant for it a useful career in the future. Many distinguished men of Kentucky, and other Southern and Western States, have been educated at this institution. The Princeton Female Academy is a most excellent institution, in charge of learned and able professors, and well pat-

ronized by the citizens of Caldwell and other counties. At *Fredonia* also is a well-conducted academy, at which are educated a large number of students from the adjacent country. The public school system of the State has made good headway in Caldwell, and instructors are engaged in teaching the children of nearly every school district. The people, who are intelligent, hospitable, and liberal in all they undertake, are becoming more imbued with the idea of general education among the youth of the country, and will exert themselves to secure to their children the advantages to be derived from a general system of free schools. The leading church denominations are the Cumberland Presbyterian, the Primitive and Missionary Baptist, the Methodist and Episcopalian, with a few Catholics, Unitarians, and Universalists scattered over the county.

Domestic Arts.—The old-time music of the spinning-wheel and loom has almost ceased to strike the ear in many neighborhoods in Caldwell; yet some excellent families, who do not know the meaning of the words "hard times," still make cloth of flax, cotton, and wool for home use, and dress the boys and girls in homespun jeans and linseys. Milk, butter, honey, eggs, fowls, feathers, dried fruit, and poultry, in ample supply for home consumption, are produced in every neighborhood, with some surplus for shipment to the outside world. These things are the outgrowth of the female industry of the land, the lords of creation seldom taking time from the routine of tobacco-raising to even temporarily give a helping hand in furtherance of these smaller industries.

Live Stock.—Several energetic, far-seeing, public-spirited farmers, like Capt. Cook, Maxwell, Hawthorne, Grooms, Allen, McChesney, and others, are introducing fine breeds of hogs, sheep, cattle, horses, and poultry, and attempting to substitute them for the old scrub stock of the country. This is a move in the right direction, and will ultimately be worth thousands of dollars to the farming interests of the country. No part of the State ought to produce better hogs and sheep than Caldwell county, or can make these branches of farming pay better. A class of wool from improved breeds of Cottswold, Leicester, Shropshire-downs, and Merinoes could be produced in the northern part of this county equal to the best fleeces of France or Spain, at less than one half the cost. Poultry, too, could here be made to pay beyond the most prosperous tobacco culture, particularly if carried on in connection with an apiary of Italian bees.

Crops.—The farmer of Caldwell worships at the shrine of "corn, wheat, and tobacco," and presses his land every year to produce the

largest possible crops of these staples. Rotation and fertilization with the plant food needed by the land have been neglected, until much of the richest lands are tired down and almost worn out. Chemical fertilizers are sadly wanting in order to bring back the sesoils to their original fertility. The northern portion of this county is particularly well adapted for orchards and vineyards, and could be made more productive than the level tracts planted in tobacco. The grapes to be planted are the native varieties, such as can stand the sudden changes in the climate, and the heat of summer; the Concord, Delaware, Ives Seedling, and Hartford Prolific have so far proved the best varieties in Kentucky. The soil and the climate here combine to produce grapes in greater abundance, which will contain more saccharine matter, and yield more wine, and an article possessing a "richer bouquet" than can be produced in the celebrated vineyards of Missouri and Ohio. The Concord can, on these lands, be made to produce 10,000 pounds of grapes to the acre, from which 750 gallons of wine can be made.

Timber and Stone.—This county is well supplied with white oak, black and red oak, post oak, hickory, cherry, walnut, birch, ash, locust, gum, maple, poplar, &c., &c. In good building stone Caldwell has all the varieties belonging to the sub-carboniferous and Chester Groups; these outcrop everywhere in convenient quarries, easy of access, and in stratifications the most convenient for the mason's use. Fire-clay and pottery earth abounds without limit, and of excellent quality.

Popular Characteristics.—The citizens of Caldwell are singularly industrious, intelligent, open-hearted, generous, and hospitable. They are the descendants, principally, of that good old Virginia and North Carolina stock, the off-shoot of the English Cavaliers, that so wonderfully impress their peculiar type of civilization and chivalrous honor upon all their descendants. Probably no better race than this exists on the planet, if we judge according to the rules of honor, integrity, bravery, intelligence, and moral worth, both among the males and females.

What is Needed.—Caldwell county needs more skilled labor and more capital. She also needs more thought among her farmers upon the subject of fertilizing and preserving their lands, so as to produce more tobacco and food, both for man and beast, with less labor. But her people are energetic, and will not lag behind her neighbors, if they can once get from under the grievous burdens of her railroad indebtedness. Let her farmers read the article on fertilization, and profit by the suggestions there made.

CALLOWAY COUNTY.

Calloway was formed in 1822, from a part of Hickman county, and named in honor of Col. Richard Calloway. It is bounded on the north by Marshall, east by the Tennessee river, which separates it from Trigg county in Kentucky, and Stewart county in Tennessee, south by Henry county, Tennessee, and west by Graves county.

Geology and Lands.—This county, like all the others on the west side of the Tennessee river, lies in the tertiary and quaternary formations, except a small portion on the eastern border that appears fragmentary, and which must, in the great "fault" or escarpment that cast down this section of Kentucky and all of West Tennessee, have been tilted over and up into its present position. The rocks that do appear are the lower series of the sub-carboniferous overlying the silicious grit of the Waverly Group. The quaternary formation has left the face of the country quite level, and in many parts prairie, which has now, since the fire has been kept off by settlers, become well stocked with young timber. There is, in many places, a very finely pulverized clay, well adapted for pottery, and from which a large amount of earthenware has been made. This formation, no doubt, can be found all over this part of Kentucky and West Tennessee, if skillfully searched for. Iron ores are everywhere found among the sand layers, in the form of "cement rocks," or concretions of sand, alumina, and peroxide of iron, while in solution, but not in quantities sufficient for profitable working. The prairie lands have a top soil of vegetable mould, mixed with silicious and marly matter, which make it exceedingly free and quick in its productive capacity. The finest quality of tobacco for "bright wrappers," or "light fillers," seems to be the natural production of these lands; yet corn, wheat, oats, flax, and hay (particularly redtop, clover, and timothy) grow well. The marls that are interstratified with the sands give a more enduring basis to the soil, and cause it to hold the manures until the staple crops can appropriate them as plant food. Lime, gypsum, salt, and bone-dust scattered in small quantities, and harrowed in just before planting of crops, will add greatly to the productiveness of the worn fields. Lignite, a kind of coal formed of hard wood, but which has not enough of fixed carbon to make it of much value as fuel, is found in large quantities in this county; in fact, it underlies all of this quaternary formation in Kentucky and Tennessee, sometimes in beds

over four feet thick, as is the case in Calloway, with logs, roots, branches, and leaves, entirely infiltrated with sand or other stony matter, until it will sound as clear and appear almost as hard as iron. Its outcrop can be seen at several points in this county, also in Graves, Ballard, Fulton, Hickman, and all along the bluffs of the Mississippi river, as low down as Memphis, Tennessee. Practically it will never be of service to man; but, on the contrary, injures by its impregnations of the otherwise pure free-stone water, wherever it abounds, and the springs or wells take their sources below its stratification. This lignite coal is frequently mistaken by the country people for true bituminous coal of the carboniferous epoch, when, in fact, it is many ages later in its formation, being composed of some trees, shrubs, and plants that are now growing as they did at its time of deposit.

Rivers.—The Tennessee river, which forms the eastern boundary of this county, affords uninterrupted navigation for steamboats of the largest class. Clark river, the west fork of Clark, Blood river, and Jonathan, Bee, and Rockhouse creeks, are the principal streams. Owing to the lack of stone or bluff banks, there are but few mill-sites on these streams where reliable dams can be erected.

Smaller Industries.—The people of Calloway are not so much affected by “fashions” as those of some others in the State. They are honest, intelligent, plain, and industrious in their habits, and keep up the good old plan of making at home most of the articles of dress which the families wear. Accordingly the flax-wheel, the cotton-cards, and the hand-loom are still popular institutions; and the energetic ladies save thousands of dollars every year by manufacturing at home cloth of jeans, linsey, flax, linen, cottonades, blankets, counterpanes, comforts, &c. Milk, butter, eggs, dried fruit, feathers, poultry, soap, and candles, sufficient for home consumption and some to spare, are produced on the farms, and the “tobacco money” is nearly all clear profit; so “hard times” are unknown, and plenty abounds.

TOWNS AND VILLAGES.

Murray, the county seat, is beautifully situated about the centre of the county, on Clark’s river, and contains about 800 population. It is quite a flourishing town, with a fine court-house and other public buildings, good churches, large academies, excellent store buildings, and many elegant private residences.

New Concord, with a population of 200 persons, is ten miles south-east of Murray. It is a remarkably thrifty town, with many factories, and does a large local trade.

Wadesboro, Boydsville, Callowaytown, and Pine Bluff are all flourishing villages, each with a good local trade.

Manufactures.—For an interior county, Calloway is quite prosperous in the smaller class of factories. At Murray are two or three tobacco factories, wool-carding mill, wagon and carriage factory, fine steam flour-mill, saw-mills, tan yard, and more than a dozen other mechanical shops and factories. At Concord are a carriage and wagon factory, blacksmith-shops, tobacco factories, tin factory, pottery, and various other mechanical shops. Besides these, there are more than a dozen other tobacco factories in the county, and many first-class saw-mills, potteries, and wheat and corn-mills. All classes of good timber abound in every part of the county, and all kinds of raw agricultural products are easily accessible to factories in any portion of the county.

Crops and Stock.—The people of this county are perfectly wedded to cotton and tobacco. Cotton grows here as well as it does in West Tennessee, and is extensively planted for home use and for sale at the Paducah and New Orleans markets. Tobacco grows here in all its perfection, suitable for manufacturing into the finest chewing plugs. The "Gold Leaf," as the trade terms it, shows its superiority by the high prices it commands in all the markets. It is very much the same as the premium tobaccos of Ballard county. Wheat, corn, oats, rye, and all other kinds of grain, hay, and fruit grow well, and are raised profitably everywhere. The live stock is not so good in blood as in the blue-grass counties, but is steadily improving each year, and will soon be above average.

Schools and Churches.—The common school system of the State furnishes schools in nearly every school district in the county for five months in the year, which gives a fine opportunity for every child to become well educated. Besides these schools, there are many private schools of higher grade in the county, and at Murray and Concord first-class academies. The Murray Institute, under the charge of Dr. J. P. Bramcock, has over 170 students. It is most ably conducted, and is an honor and an ornament to the county. The Baptist and Methodist are the most prevalent denominations of Christians.

CAMPBELL COUNTY.

The county of Campbell, named for Col. John Campbell, was formed in 1794, out of parts of Scott, Harrison, and Mason. Since then it has been greatly reduced by the formation of other counties from its territory, until now it is bounded on the north and east by the Ohio river, which separates it from the State of Ohio, south by Pendleton, and west by Kenton county.

Geology and Soil.—The upper Cambrian or lower Silurian formations underlie all this county, the northeastern part approaching very nearly the lower Cambrian. The lands are quite undulating, except the river bottoms and some plateaux on the ridges. The soil is generally good, varying, however, according to the stratum of rocks which comes to the surface. The best lands are the bottoms and the gently rolling sections, underlaid with the calcareous shelly limestones and interstratified marls. The mudstone formation is nearly the same as in Boone and Pendleton counties, and gives a specific class of soil quite different from that formed by the Silurian strata in parts of Harrison, Bourbon, and Fayette. The bottoms are well adapted for corn, hay, &c., while the hill-sides produce good tobacco, cereals, and grass. Fruit does well on the uplands, and grapes yield most excellent crops on the east and south slopes of the hills and ridges.

Garden Farming.—Owing to its proximity to Newport, Covington, and Cincinnati, Campbell county is from necessity forced to become, in a great measure, cut up into garden farms to supply these markets, and her soil is well adapted for this purpose. Fruits of all kinds flourish and produce abundant crops; berries grow well, and melons of all sorts yield largely; garden products grow as well as in any portion of the west; cabbages, potatoes, onions, beets, leeks, cauliflowers, celery, radishes, turnips, parsnips, salsify, cymlings, cucumbers, asparagus, and all other vegetables come to great perfection; vineyards pay well, and the native wines of the country never fail to make remunerative crops, both for the table use and wine.

Poultry and Milk.—The fine blue-grass affords Campbell the basis of the best dairy products, such as cannot be found anywhere outside of the Blue Grass Region, and gives her the facilities for supplying milk,

butter, and cheese of the best quality in unlimited quantities. The fine spring-houses to be met with on almost every farm can be used as creamaries to prevent the milk from becoming sour or unfit for use until it is marketed.

Chickens, ducks, geese, turkeys, guineas, and pigeons are peculiarly adapted for the country, and henneries, properly managed, can be made to pay more largely than any other class of farming whatever. The amount of poultry consumed by the three cities of Newport, Covington, and Cincinnati is enormous, and steadily increases every year, *pari passu* with this growth of these large manufacturing and commercial centres.

CITIES AND TOWNS.

Newport (see article towns and cities), the metropolis of the county, and partly the county seat, is one of the most thriving cities of the West, containing over 25,000 population. It is connected with Cincinnati by an iron railway bridge, which has side tracks for vehicles and foot passengers. It is also connected by a similar wire-suspension bridge over the Licking river with the city of Covington. The public buildings, city hall, court-house, public schools, churches, theatres, and post-office are all elegant specimens of architecture. The large manufactories, mechanical shops, and stores will compare favorably with those of Cincinnati, while a great number of the private residences are princely in their finish, appearance, and furnishing. The *United States Military Station* at this point has always been one of the best appointed in the nation, and a general rendezvous of the regular army whenever needed in the West or South. The growing importance of this city, as an offshoot of the growth of Cincinnati in large factories and commerce, is becoming more apparent each year, and the time is not very far distant in the future when Newport and Covington combined, with their suburban villages, will outnumber Cincinnati in population, and excel her in the number of manufactories.

Belview, on the Ohio, just above, and *Dayton*, just east of Newport, are very flourishing towns, the former having 1,000 and the latter 2,000 people. They are really suburbs of Newport, and will some day join with her in making a great city on the Kentucky shore.

Alexandria, the other county seat, is thirteen miles back of Newport, about the centre of the county, and contains some five or six hundred population. The public buildings at Alexandria are good and commodious, the churches and school-houses excellent, and the private resi-

dences fine and comfortable. It also contains quite a number of smaller factories and mechanical shops.

California, twenty-three miles above Newport on the Ohio river, and *Carthage*, a few miles from California, are handsome villages, each doing a large local trade.

Transportation Facilities.—No place can be better located for traveling and transportation facilities than Campbell county, with the Ohio river on two sides, the Licking river on another, and railroad bridges connecting her principal city with both Covington and Cincinnati.

She is connected by railway systems wherever Cincinnati is connected, and by steamboats with every part of the Mississippi Valley. The United States chose this point for her western barracks, because the landing and harbor were good, and on account of the easy facilities for reaching all points in the West and South without transshipment, as well as from the great abundance of supplies that could here be speedily furnished to support troops at a most moderate cost.

Manufactures and Commerce.—The number of factories in Newport is far greater than is usual for a city of its size, owing to its peculiarly advantageous position to the Cincinnati market, and the cheaper price of land. Many large Cincinnati firms have their factory establishments located in Newport and Covington, because of the convenience and easy grade in delivering all materials either to or from the river or railways. Nearly every kind of factorage business conducted in Cincinnati is carried on also in Newport, and here are made almost every species of wood, iron, steel, and glass work sold in Cincinnati. The fine locality of Newport will gradually attract other and larger factories, as will also be the case with Covington and the adjacent villages, until the larger volume of manufacturing industries of this vicinage will be located on the Kentucky side of the Ohio river. The commerce and trade of Campbell county is already very large; but this, too, will increase and change with the influx of population and capital, until she will become one of the wealthiest counties in the Mississippi Valley.

Schools.—Newport has an excellent system of public schools, in which are employed over 45 teachers, who instruct over 2,000 students. There is a school fund of nearly \$60,000 a year, collected from the State and the citizens. There are primary, intermediate, and high school departments, in which every child can be taught according to its capacity and requirements. German is taught to all the scholars who may elect it as

one of their studies. Throughout the county there are public schools, taught under the State school system, in every district, so that facilities for a good common education are afforded to every child whose parents or guardian will send them to the schools. Besides the common schools, there are several private academies and seminaries of learning, well patronized by the people of this and adjoining counties.

Live Stock.—Like the people of the other blue-grass counties, the Campbellites delight in fine breeds of all kinds of live stock, and take great pains to have the very best horses, cattle, sheep, swine, and poultry. In fine trotting horses, large hogs, and extra milk-producing cattle, Campbell is the peer of any adjacent county, and the pedigrees of much of her stock is sought after by fancy breeders throughout the country. Bees do well, and honey-making is becoming an important industry.

The Population is much more mixed in nationalities than we usually find in other counties of the State, having a large proportion of foreign and northern born citizens. This results from the proximity of Cincinnati, where the German and northern elements prevail most extensively. Society is excellent, and true hospitality is found everywhere. The admixture of different nationalities does not in the least destroy good neighborhood; and though in many instances different languages are spoken, yet all are friends, and now equally Kentuckians. A more intelligent, refined, and industrious population it would be hard to find in any country, and all unite in desiring emigrants from the Northern States and Europe to come and settle among them.

Churches and Societies.—Every denomination of Christians have their churches and separate congregations. There are many elegant buildings devoted to church and eleemosynary institutions in Newport, as well as in other parts of the county. The Freemasons, Odd Fellows, Knights of Pythias, Ancient Order of Red Men, Turners, and other orders, have flourishing lodges in the cities and towns, and people of different nationalities usually preserve here their favorite societies and festivals. The large number of Germans throughout the county, who are generally hard-working, honest, and thrifty citizens, give quite an impetus to garden farming and fruit-raising, such as is found in but few places in the Western States. These people enjoy themselves greatly, and besides becoming rapidly rich, seem to keep up their old customs of the fatherland with the same zeal that they did on the Rhine or on the rich lands of Holland.

CARROLL COUNTY.

The county of Carroll, named for Charles Carroll, of Carrollton, Maryland, was formed in 1838, out of a part of Gallatin. It is bounded on the north by the Ohio river, which separates it from the State of Indiana, east by Gallatin county, south by Owen and Henry, and west by Trimble.

Geological Formation.—The lower Silurian formation underlies the whole of this county, and gives to its soil great fertility, in places where the disintegration of the marly and calcareous slabs are the top-most rocks. In other places, on the hills or high lands, where the mud-stone of this era prevails, the soil is not so good, and resembles very much the hill lands of Boone county. There are no minerals in this county, unless there be slight traces of lead or iron, such as is found occasionally elsewhere in this formation. The river bottoms, which are quite extensive, consisting of a first and second elevation above the general level of the rivers, are exceedingly fertile and peculiarly adapted to the growth of Indian corn, potatoes, pumpkins, and all classes of vines. The uplands are rolling, with many very steep hills, on which grow fine wheat, oats, barley, rye, and a most excellent quality of tobacco. Hay and grass will flourish in any part of the county, so that stock of any kind can be raised with profit. Sheep husbandry would prove very remunerative, and the soil, climate, and grasses which grow on the hilly surface of the county, are such as to produce the very finest of wool and mutton. The eastern and southern slopes of the ridges and hills are well suited for vineyards, and the wine produced here could be made superior in saccharine matter and “bouquet” to that of Missouri or the Lake Shore in Ohio.

TOWNS AND VILLAGES.

Carrollton, the county seat, located on the Ohio river, just above the mouth of the Kentucky, contains a population of 1,200 persons. It contains a good court-house and other public buildings, several excellent churches and hotels, two large academies, and many fine private residences. Being at the mouth of the Kentucky river, it has a good location for a manufacturing city, with raw material of every kind in

easy reach. There are several factories now in operation, but not a tithe of what should be running, when we consider its advantageous position. It has a woolen mill, flouring mill, steam saw-mill, wagon and carriage factory, several iron shops, and a dozen other mechanical shops.

Ghent, a town of about some five or six hundred population, is handsomely located on the Ohio river, eight miles above Carrollton. It is a place of large local trade, and well located for manufacturing purposes.

Prestonville, at the mouth of the Kentucky river, immediately opposite Carrollton, has a population of three hundred persons, and does quite a handsome trade on the south side of the river.

Worthville is a neat, well-located village, on the Kentucky river, at the crossing of the Louisville and Cincinnati Short-line Railroad.

Rivers and Creeks.—Carroll county is well provided with navigable streams, having the Ohio river along all her northwestern and northern border, and the Kentucky running centrally through the county. No part of the county is over six to eight miles from navigation. Besides this, the Louisville, Cincinnati, and Lexington Railroad passes along her eastern border, giving every facility for reaching the markets of either Louisville or Cincinnati every few hours in the day. Little Kentucky river, Eagle, Mill, and George creeks afford many fine sites for factories or mills.

Live Stock.—For several years, the more public-spirited, energetic citizens of the county have been introducing better pedigrees of horses, cattle, hogs, and sheep, until now the stock of the country is much above average in blood. The fine blue grass, which grows well, gives good bone, muscle, and fat tissues; and, in conjunction with the fine corn of the bottom lands, produces some of the largest cattle, sheep, and hogs that go into the markets of the West.

Labor.—Since the war, there has not been, altogether, labor enough to cultivate all the open lands. The negro labor was uncertain and unreliable. Some white labor has come in, but not as much as is desired. The people are anxious to welcome more good laborers, and will either sell them lands at a fair price, or give them employment at good fair wages.

Smaller Industries.—Carroll county can always find an easy market for all fruit, vegetables, poultry, eggs, milk, butter, canned goods, melons,

feathers, and fresh meats; these it can send to either Louisville, Madison, Covington, Newport, or Cincinnati. These advantages already make her partially a suburban market garden for those cities, but not so much so now as it will become in the near future. The cultivation of orchards, vineyards, gardens, nuts, berries, bees, and poultry will pay better than farming on a larger scale in the cereals and tobacco. Dairies, too, would do well in this county, and a co-operative butter and cheese factory could be made to supply first-class articles for the adjacent cities, at prices that would drive out the imported articles that now feed the city populations. A revolution will have to take place in farming in all those counties adjacent to large and thriving cities, and a subdivision of the large plantations into small farms will increase the wealth, energy, and population to an almost limitless extent.

Schools and Churches.—The common school system of the State now supplies teachers in every school district in the county, and the people are giving every possible assistance to these schools, in order to make them effective. There are two excellent academies located at Carrollton and one at Ghent, besides other good private schools in different parts of the county. Every child over six years of age can become well educated if the parents only do their duty in sending to the schools. Churches are conveniently located with respect to every neighborhood in the county. At Carrollton, Ghent, and Prestonville are several churches, belonging to different denominations, all flourishing and well attended. The Methodists, the Primitive and Missionary Baptists, the Presbyterians, Episcopalians, and Reformed Christians, are all represented. The Catholics, Unitarians, and Universalists have members scattered throughout the county, but are not so numerous as the others.

County Roads.—Owing to the steep ridges and hills the roads are not so well macadamized as they are in Central Kentucky. The turnpikes, however, and the usually well-worked county roads, afford excellent facilities for reaching the market-places and shipping points on the rivers and railways, so that but little trouble is given the farmer on account of roads.

CARTER COUNTY.

This county, named for Col. Wm. G. Carter, was formed in 1838 out of parts of Greenup and Lawrence, and is bounded north by Lewis and Greenup, east by Boyd and Lawrence, south by Elliott, and west by Rowan, Fleming, and Lewis counties.

Geology and Minerals.—Three fourths of this county lies on the carboniferous rocks. It is divided by Little Sandy and Tygart creek into three sections. That east of Little Sandy is the true coal measure, and is quite hilly and broken; that part between these streams is high and ridgy, and contains the sub-conglomerate coals, and many beds of iron ores; that part west of Tygart creek begins on the sub-carboniferous limestones, and passes into the coal measures, and affords much fine arable land on the bottoms and gentle slopes of the creeks. The beds of coal are found nearly over the entire area of the county, and the amount of iron ores in this region almost defies computation, and its proximity to the coal makes it doubly valuable. Dr. D. D. Owen, in his report, says: "When these ores of Greenup and Carter counties come to be smelted with coal, as they undoubtedly must before long, the amount of iron which they are capable of supplying is immense. We have seen, from the facts collected simply by a rapid reconnoissance of the country, that from five to eight beds can be found above the drainage of the country, in ridges three hundred feet high, which will average eighteen inches in thickness; and the geological position of the ore is such that these beds may be followed entirely through the hill in conformable stratification *with the associated beds of coal*. We have seen, moreover, from the chemical analyses of these ores, that they will average, at a very moderate estimate, one third the weight of iron from the raw ore. Taking the united thickness of the different beds in a single hill at five feet, and the specific gravity of the ore at three, then each acre of land, underlaid by these ores, is capable of yielding from six to seven thousand tons of iron, which, in the form of pig iron, may be estimated to be worth at least \$180,000. The coal in the same hill would be worth from \$16,000 to \$20,000 per acre."

On the waters of Tygart creek good hydrated oxide ores are found in connection with the sub-carboniferous limestones, different from those spoken of by Dr. Owen above, but similar to the ores of Tennessee and

Southwestern Kentucky, on Cumberland river, which have assayed over fifty per cent. of the best and toughest soft iron.

Cannel Coal of a superior quality, and shale rich in oils, are seen outcropping on all the creeks and ravines. Few countries in the world are so rich in mineral wealth as this section of Kentucky, and probably no place affords better facilities for bringing this wealth to the surface.

Soil, Crops, and Curiosities.—As a farming country, this section of the State will not compare favorably with either the "Central Blue Grass Region" or the "cavernous limestone section of the barrens," yet there is much fine farming land on the river and creek bottoms, as well as on the gentle slopes of the ridges. There are three agricultural industries that can be followed here with great profit, viz: Sheep husbandry, orchard and vineyard cultivation, and a new industry, which is indicated by the wild cranberries which everywhere show themselves on Little Sandy, Tygart creek, and their tributaries. No doubt but that, with proper care, the cranberry crop of this section can be made more profitable than it is in Massachusetts or New Jersey, where an acre of well-set cranberry bushes, that can be overflowed at pleasure by a small dam on a creek or branch, is valued at over \$500. The soil is particularly adapted to the growth of large forest trees, which here come to great perfection, such as poplar, beech, gum, walnut, pine, hackberry, white oak, &c., &c., while the beautiful laurel and ivy crown every bluff and precipice. Whortleberries, chinquapins, wild grapes, haws, papaws, persimmons, hickory nuts, walnuts, hazlenuts, wild plums, and cherries grow in boundless profusion.

A strange curiosity for Kentucky are the numerous caves of this section, carved by water out of the thick beds of sandstone adjacent to the sub-carboniferous limestone. These are entirely different from the caverns of the "barren region of South Kentucky," and more closely resemble many of the saltpetre caves of Northern Arkansas. Near Sinking creek is a remarkable artesian well, which emits a stream of water over two feet in diameter. Many excellent salt wells have been worked in Carter county, which no doubt take their saline matter from the many shale beds that exist throughout this entire section of country. There are in this county several "natural bridges" formed by nature over creeks and ravines. One across Little Caney, sixteen miles from Grayson, is about two hundred and twenty feet span, and nearly two hundred feet high, twelve feet wide, and over five feet thick at the centre of the arch, with abutments reaching arch-shaped to the centre of the apex. This is nearly equal to the celebrated natural bridge of Virginia.

TOWNS AND VILLAGES.

Grayson, the county seat, is beautifully located on the west side of Little Sandy river, and contains about three hundred and fifty persons. It has a handsome court-house, several churches, and good school-houses. *Star Furnace*, nine miles east of Grayson, is quite a thriving village of two hundred and fifty population. *Olive Hill*, fifteen miles west of Grayson, is a flourishing town, with a large local trade. *Geiger-ville*, in the eastern part of the county, has two hundred population, several stores, a fine school, and a thrifty, flourishing trade.

Manufactories and Mills.—There are in this county five or six furnaces in full blast, making a large amount of iron, seven or eight good water mills, and about as many steam, grain, and saw-mills, all doing excellent business. There are in the county numerous blacksmith and wood-workmen shops, besides many lesser mechanical shops and tanneries.

Smaller Industries.—The good people of Carter county are honest, industrious, and intelligent, and hold on to the old-time ways of making at home jeans, linseys, cotton and flax goods, socks, comforts, quilts, and counterpanes, and producing in abundance milk, butter, cheese, maple sugar, molasses, eggs, poultry, feathers, beeswax, honey, shuck and bark collars, dried fruits, ginseng root, and many other useful articles for home use and traffic. Of course the ladies do not run after the fashions, nor the men growl over "hard times," but every one has plenty of the substantials of life, with many of the luxuries, and, best of all, uninterrupted good health. The numerous iron and coal-mining companies afford market for all the surplus of the articles that the ladies manufacture, as well as for the corn, hay, pork, mutton, and beef raised by the industry of the male population.

Schools and Religions.—The common school system of the State is operative over every district in the county, besides which, there is a fine academy and several excellent private schools taught by able professors and teachers. The Primitive Baptist, the Free-will Baptist, the Methodist, the Reformed Christian, the Catholic, and Presbyterian are the principal denominations in this county. Several of the church buildings in the county are very handsome, while others are of the primitive style of architecture; but the congregations worshipping in these latter are none the less devout or hopeful because of the absence of fine fluted columns and deep-toned organs.

Facilities for Transportation.—The distance from any part of this county to the Ohio river is not beyond a day's travel with a loaded

wagon, and still nearer to points on the Big Sandy river. The Elizabethtown, Lexington and Big Sandy Railroad will, when built, pass through this county, giving easy and quick access to every neighborhood of reaching the Ohio and Big Sandy rivers and all parts of Central Kentucky; parts of this road are completed, beginning at the river terminus and extending into the county. The county seat is connected by railroad with Riverton, on the Ohio river. The county roads, owing to the uneven face of the country, will continue to be "rough."

Miscellaneous.—Here is a field for capitalists who want to invest in mining operations on a large or small scale, as there is no limit to the mineral and coal beds and native timber of the country. Here, too, is a field open to persons who wish to raise fruit for the purpose of canning and shipment, and also who desire to make fortunes in making honey of the best quality. Here, too, is the best point in the West for cranberries, and a most excellent field for the shepherd to roam with his flocks over the coaleries adjacent to all the large furnaces, and to shear the heaviest fleeces of the finest wool for the eastern and western manufacturers.

CASEY COUNTY.

This county, named in honor of Col. Wm. Casey, was cut off from Lincoln in the year 1806, and is bounded on the north by Boyle and Lincoln, east by Lincoln and Pulaski, south by Pulaski, Russell, and Adair, and west by Russell, Adair, and Taylor counties.

Geological Formation and Soil.—The geology of Casey is decidedly mixed; beginning in the lower Silurian, it passes through the upper Silurian, the Devonian, the shaly formation, and knobby hills, the Waverly series, into the sub-carboniferous limestones. Points and lines of the great upheaval fault that elevated the blue limestones of the early sedimentary ages, and brought them upon a level with the carboniferous limestones, are plainly visible in many parts of this county. The deepest cuts made by the streams expose the blue limestone, while on

the tops of the hills is found the Lithostrotion limestone reposing upon the gray and black slate or the knobby sandstone. The sandstone is frequently so fine-grained as to make good whet-rocks; the shale is usually about forty feet thick, and quite full of potash salts. The upper Devonian and Waverly series form a large portion of the soil of Casey county, particularly the cold crawfishy lands, which are too retentive of water in the winter and spring, and too dry in the late summer and fall, for good crops. There the sand rocks come to the surface; the soil is much freer, but thin and meagre in plant food, and in some places so very hungry that manure placed on it is absorbed or sinks before the crops can take it up. Much of the land is sour, as is evidenced by the growth of water-maple, dogwood, sorrel, broom sage, &c., and could be greatly improved by the addition of lime or land plaster, ashes, and German kainit. Next to Pulaski county are the highest lands, which are well adapted for fruit orchards and vineyards. Here grapes will flourish equal to any part of the State, and sheep husbandry pay much better than clean crop farming. Wine and wool ought to be produced in large quantities, and fruit and wine should be shipped to all the Northern markets of the Union from the hill lands of Casey.

TOWNS AND VILLAGES.

Liberty, the county seat, beautifully situated on Green river, has a population of three hundred persons, and has a good court-house and other public buildings, several fine churches, an excellent academy, and many nice private residences. There are several flourishing villages, each of which do a good local trade: these are *Millersburg*, seven miles northeast from Liberty; *Mintonville*, in the southeast part of the county, and *Caseyville*, a few miles from Liberty.

Rivers and Creeks.—Green river, taking its rise in Lincoln, passes through the centre of the county, and with its branches affords several good sites for mills and factories. Rolling Fork of Salt river runs through the northern part of the county, and drains the “knobby hill” country which passes through this county. Along its sides are no doubt some ores of iron and springs of mineral water, similar to those found in Bullitt and Nelson counties.

Schools and Churches.—The public school system is in operation over the entire county, and a school taught in almost every district. The people are taking more than usual interest in the subject of educating their children, and generally send to the school all who are old enough to attend. There is a fine academy and several private schools of high-

er grades in the county, in addition to the public free institutions, so that every child, whose parents desire it, can become a good scholar. The "Hard-shell" Baptists, the Missionary Baptists, the Methodists, Reformed Christians, and Presbyterians are the principal denominations in Casey county. The churches in the towns are well built and very comfortable. Those in the country generally are of a more unpretending style of architecture. The members, being honest and not overly much proud, make up in zealous piety what their church buildings lack in tall steeples and loud-sounding organs and finely-cushioned seats.

Domestic Arts.—The flax-wheel yet stands high in Casey; and the cotton-wheel, wool-cards, and the hand-loom are everywhere heard, reverberating the chorus to the sweet songs of the ladies, who ply the shuttle and the distaff. A very large amount of jeans, linsey, flax and tow linen, cottonades, counterpanes, sheets, comforts, blankets, towels, cotton and yarn stockings, and other classes of wearing apparel, are manufactured every year by the intelligent, energetic, industrious ladies. In addition, they raise poultry of all kinds, and sell feathers, eggs, maple sugar, molasses, honey, beeswax, ginseng, and dried fruit. In this way a family supports itself at home; never runs in debt, and never "breaks" or cries out "hard times," or knows the want of the necessities of life. Happily, too, from such energetic and industrious stock comes a large majority of the population of our country, to infuse new life and health into every generation of the effeminate offspring of our fashionable city belles.

Live Stock—The people of Casey county have a great fancy for the old native breeds of horses, sheep, and cattle, preferring, as a general rule, the razor-back, long-faced swine to the chuffy, heavy-quartered Berkshire, and the old crumpley-horned, slim-sided, long-legged cattle to the purest bloods of the Durham or Alderney. The scrub stock of horses, also, seem to be favorites; but latterly some enterprising, public-spirited farmers are beginning to find out that it is cheaper to feed hogs plentifully than to allow them to expend all their strength standing on their snouts, with their hind feet in the air, reaching down two feet below the surface in search of a sweet-briar root, and that good, sleek, trim-made cattle are cheaper for beef than the old kind; and so they are introducing them into the county, with the expectation that in a few years the pedigrees will be greatly improved.

Timber.—Casey county is well supplied with all kinds of timber—oak, cypress, gum, poplar, walnut, hickory, pine, ash, ironwood, wahoo,

papaw, sassafras, sugar-tree, wild cherry, honey locust, maple, hornbeam, and various other kinds suitable for house lumber, cabinet work, or boat-building. The white oaks and hickories growing on the Devonian formation are superior to all others for wagon work, carriage work, or steamboat paddles. When Casey county gets a narrow-gauge railroad, she will prove that nature has here poured out native wealth with a lavish hand.

CHRISTIAN COUNTY.

This county was formed from a part of Logan in 1794, and named in honor of Col. Wm. Christian. When first cut off from Logan, it extended over all the territory lying westward from the Logan county line to the Ohio and Mississippi rivers. It is now bounded on the north by Hopkins and Muhlenburg, east by Muhlenburg and Todd, south by the Tennessee State line, that divides it from Montgomery and Stewart counties of that State, and west by Trigg and Caldwell counties.

Geology and Soil.—This county is about equally divided between the sub-carboniferous limestone formation, which is the basis of the southern, and the carboniferous lime and sandstones, which are the base of the northern half of the county. The line of demarcation between the two formations passes nearly centrally through the county, from east to west, with occasional deflections to the right or left. The northern part of the county is hilly and broken, and abounds in the finest of timber, coal, and iron ores. The southern part is level or gently rolling, with the frequent sinks or basins which distinguish the "barrens" of Southern Kentucky. Near the line of demarcation between the two geological formations, from east to west, is a continuous escarpment, inclining northward or northwestwardly, showing most conclusively that in the early geological eras there must have been either an *up-throw* or upheaval of the Lithostrotion or sub-carboniferous limestone, or a *down-throw* of the coal formations, most probably the latter, since the strata of the cavernous limestones are nearly horizontal, while those of the coal measures are disjointed, and under different angles of inclination.

Along this line of demarcation, also, are frequently found specimens of lead ore (sulphurets or galena) and fluor-spar, particularly in the counties of Caldwell, Livingston, and Crittenden, where the same disturbance exists as in Christian. In fact, this disturbance is found around the entire rim of the carboniferous formation of the Western Kentucky coal field. On the road from Hopkinsville to Greenville, one and a half to two miles northeast of the former place, this down-throw is quite plainly visible just before reaching the banks of Little river. The coal beds of north Christian are practically inexhaustible, while the iron, either limonite, brown hematite, or pot ores, exist in large quantities. In the State Cabinet is a sample of these ores from a tract of land belonging to Major John P. Campbell, containing 2,600 acres, which show over sixty per cent. of metal. The ores are scattered all over this tract, as well as over the adjacent country. The soil in the northern part of the county is poor on the hills and ridges, often quite rocky, but exceedingly fertile in the bottoms. The hills are well adapted to the growth of a fine quality of tobacco, and all kinds of fruit. Here orchards and vineyards never fail of a good crop. In the southern part of the county the lands are level and very rich, with a subsoil of red or chocolate-colored clay, which itself contains all the elements of plant food needed by the prevailing crops of the country. It is on these cavernous limestone or "barren" lands (so named from their prairie character of having originally but little timber) that the far-famed "Hopkinsville Shipping Tobacco" is grown in such perfection. There are no minerals in this formation, in the southern part of the county, worth working. The timber of the barrens consists of red oak, hickory, white oak, and such other kinds of hard woods as have grown up since the fires have been kept off by the settlement of the white race. There are several mineral springs of excellent water in different parts of the county.

Agriculture.—No part of Kentucky excels the southern portion of Christian as a *farming country*. Here grows corn, yielding from twenty-five to seventy-five bushels to the acre; wheat from ten to forty-five bushels; oats from twenty to fifty bushels; potatoes from fifty to three hundred bushels; tobacco from six hundred to fifteen hundred pounds to the acre, and clover from twelve to thirty-six inches in height. Blue-grass will not flourish on account of the compact nature of the clay subsoil, but herds-grass, timothy, clover, orchard-grass, Hungarian, and millet do as well here as in any uplands in the State. Fruits of all

kinds do well in every part of the county, but particularly so in the northern half, where peaches, plums, apples, cherries, quinces, and pears always yield good crops when other counties make entire failures. Grapes, too, so far as they have been tried, succeed admirably, and the wine made from the vineyards near Hopkinsville equals any made in the West. This is the largest tobacco-growing county in the world, and the largest wheat producing county in Kentucky.

Live Stock.—Some of the finest racing and trotting horses in the State have been bred in this county, and the breeds of cattle, mules, sheep, hogs, and poultry will compare favorably with much of the far-famed blue-grass stock of Central Kentucky. The Short-horns or Durhams and Alderneys are the favorite cattle, the Poland-China, Chester Whites, the Cheshire, and Berkshire, are the most highly prized hogs, while the Merino, Cottswold, and Southdown sheep are preferred to all others. In poultry the game, dominique, Spanish, and light Brahmas are the best chickens. Honey culture has taken a great stimulus within the last few years, owing to the introduction of the Italian bees and the "Tennessee hive" and mel-extractors, and wonderful stories are told of the immense yields from a single hive or colony of these industrious insects. Hog and chicken cholera have been very destructive some years, since the war, among the swine and poultry, but some farmers think they have found a remedy in the use of coal cinders fed to the hogs, and coal oil and sulphur fed on the corn, or with mush or slops. The most active men, in the introduction of fine stock into this county are Peter Fox, Rice Dulin, M. D. Davie, G. M. Quarles, Wm. Radford, Winston Henry, Col. Starling, James Jessup, Dr. J. Clardy, Dr. Rodman, and Dr. Whitlock.

TOWNS AND VILLAGES.

Hopkinsville, the county seat, is handsomely located upon Little river, about the centre of the county. It contains a very fine court-house and other public offices, a dozen elegant churches, several large manufacturing, grist, and saw-mills, and lumber and planing factories, agricultural implement works, wool-carding, tobacco factories, stemmeries, large, well-appointed stores, one male college, and two female colleges and academies, several free schools, a score of mechanic shops, and numerous large, well-built, and handsomely furnished private residences. The population is between five and six thousand. There are four or five extensive warehouses, at which are sold annually from ten to twelve thousand hogsheads of tobacco, besides hundreds of thousands of bush-

els of corn, wheat, oats, barley, potatoes, and rye. The Evansville, Henderson, and Nashville Railroad passes through the town, and gives easy communication every day to all points East and West. (See account of this place under the head of cities and towns.)

Pembroke, ten miles southeast from Hopkinsville, on the railroad, is a large shipping point for an excellent region of country. It has a population of about three hundred and fifty.

Longview, eleven miles from Hopkinsville, on the Clarksville road, is a neat village of about sixty population. *Oak Grove*, on the same road, four miles south, has about the same number of inhabitants. *Garrettsburg*, fourteen miles south of Hopkinsville, on the Palmyra road, is a beautiful village of one hundred and twenty-five inhabitants. *St. Elmo*, fourteen miles southeast from Hopkinsville, is a small village of thirty inhabitants. *West Fork* is four miles east of St. Elmo, and is twice the size.

Bennettstown, fourteen miles southwest from Hopkinsville, on the Dover road, is a neat thriving village of one hundred inhabitants; *Lafayette*, nineteen miles from Hopkinsville, also on the Dover road, near the Tennessee State line, is quite a handsome town of three hundred inhabitants; *Bellevue*, ten miles southwest of Hopkinsville, on the Canton road, is a beautiful village of one hundred and fifty people; *Church Hill*, six miles from Hopkinsville, is a place of twenty-five inhabitants; *Bainbridge* is a small, neat village on the Prince road; *Crofton* is a town of considerable trade, on the line of the railroad, sixteen miles north of the county seat, and contains a population of about two hundred; *Petersburg* is a small village of some fifty inhabitants, twenty miles north from Hopkinsville, on the Madisonville road; *Fairview*, twelve miles east of Hopkinsville, is quite a pretty town of three hundred inhabitants; it lies partly in Christian and partly in Todd county; *Beverly* is a neat village of twenty-five people, located eight miles south of Hopkinsville, on the Palmyra road, in a very rich landed neighborhood.

Streams and Mill-Sites.—The elevated plateau lands, which distinguish this county, give rise to several rivers and creeks flowing north, east, south, and west. The principal of these are West Fork and Pond river flowing north into Green river, Little West Fork flowing east and south into Red river, Little river and its tributaries flowing south and west into Cumberland and Tradewater, and its branches flowing west and northwest into the Ohio. Each of these streams afford several fine sites

for mills, furnaces, or factories, and have, since the first settlement of the country, been well supplied with grist and saw-mills. Along these streams, even in the "barrens," grow forests of the best quality of useful timber.

Schools and Churches.—At Hopkinsville are located two male high schools and two female colleges. The *Neotrophan Male School*, under the charge of Prof. Jas. G. Branham and his able assistants, has a good patronage from the town people and the citizens of the county. The *Hopkinsville High School*, under charge of Prof. J. G. Terrell, besides the regular curriculum of studies, has military drill after the forms at West Point. The *South Kentucky Female College* under the auspices of the Christian Church, is ably conducted by Prof. R. C. Cane and an able corps of assistants. The *Bethel Female College* is under the patronage of the Baptist Churches of Kentucky, and has a large number of pupils. Prof. J. W. Rust, the President, is one of the most noted and accomplished teachers of females in the State, and by his zeal and ability has built up this institution to be of the best in the western country. Mrs. J. G. Branham's school for girls is also a good institution, and well patronized by the citizens of the town and county. There are several colored schools in Hopkinsville and in different parts of the county, taught under the State system.

The free common schools of the State are taught in every district in the county, and are generally well attended. Besides these, there are several good private schools in the county. The people of no portion of Kentucky take more pains to have their children well instructed than the citizens of Christian, and nowhere is there a more general or widely spread intelligence among the people.

Churches.—The principal Christian denominations are the Missionary Baptist, Methodist, Reformers or Christian, Presbyterian, Episcopalian, Catholic, and Universalist. The church buildings in the towns are fine and well furnished, and those in the country are well-built, large, and comfortable. In the northern part of the county the prevailing sentiment is that of the Universalists, who have several churches and congregations, under the management of the Rev. Joab Clark, an able, eloquent divine, and other co-workers. The other denominations have churches scattered over the county, so as to provide one or more to every neighborhood. The membership is quite large, and the congregations noted for their high regard for order and intelligence. The ministers are generally able, eloquent speakers, and the members well-posted, thinking, and moral Christians.

Smaller Industries.—Previous to the war nearly every family manufactured at home all the cloth needed for every-day wear; and although *tobacco was king* of the crops, and the people the most wealthy in the State (owning the largest farms and the most slaves), still they kept up the old habit, brought from Virginia and North Carolina, of carding, spinning, and weaving. The cotton patch and flax patch grew on nearly every farm, and the female slaves all knew how to card and to spin or weave. The industrious, energetic white women, too, all were taught how to perform and superintend these points in the domestic household department. Since the war, however, this custom of making home-made cloth has gone out of use, except in some few neighborhoods, or among some of the most thrifty and industrious ladies. The establishment of the railroad depots has created quite a traffic in fruit (green and dried), vegetables, eggs, poultry, butter, feathers, beeswax, honey, flaxseed, hides, maple sugar, and tree molasses, from which the farmers clear quite a large sum of ready money each year. Col. Morris and Samuel B. Younglove, Esq., have taken the lead in grape culture and wine-making.

Characteristics of the People.—The original settlers of Christian county came principally from Virginia and North Carolina, and were some of the best families of that good old cavalier stock which has made those States so celebrated in the annals of our country. These settlers brought with them large families of negro slaves, which constituted a large part of their wealth. The slaves formed the body of laborers upon the farms, and by working the rich prairie or "barren" lands, added greatly to the capital of the country. The masters overlooked and directed the labor, which was their property, so that every plantation was, in fact, a small independent community, under a peculiar patriarchal system of aristocratic government, over which the master presided as lord and owner. Educated under these conditions, the men naturally became controllers or managers of men, which begot a spirit of chivalrous independence so characteristic of the Kentucky and Southern people. The high-toned honor thus engendered has become hereditary, until now the Kentuckian of this type is among the noblest specimens of the human family. This same freedom from the drudgery of daily manual labor, yet a necessity of constant overseeing or superintendence, gave a good appreciation of business qualifications above those of the day laborer, and also begot a habit of generosity and hospitality, which has for more than an hundred years been a distinguish-

ing trait in the manners and character of our people. It also gave time for study and improvement of the mind, both through the instrumentality of books and conversation; hence originated our wise statesmen and eloquent orators. The impress of these things are still inheritable and visible among the people of Christian county, in as high a degree as in any part of the Southern States; therefore we will find here a sociability, a high-toned morality, a general spread of intelligence and learning, a generous hospitality, and a chivalrous politeness, not excelled by any people on earth. A more noble or a braver manhood could not be attained under any conditions surrounding the people of any other country. This condition of things also gave a high-toned impression of the purity, chastity, and excellence of our women, and an exalted idea of their virtues, tastes, and refinement, which is seldom met with in other countries of the earth. It almost runs into woman adoration towards our mothers, sisters, wives, and the feminine part of our race generally. This type of civilization has no superior in any country, and has rarely been equaled in any age.

Labor and Farms.—The farms in the southern part of the county were in a very high state of cultivation; the number in such condition is still very great. Before the war farms sold at from \$50 to \$95 or \$100 per acre, according to improvements, soil, &c., &c., but now the want of labor and the loss of capital have reduced them from one half to two-thirds of these prices. Then farm-houses and fences, stables and yards or lawns, all exhibited refinement of taste, and a marked appreciation for rural elegance and beauty. Many elegant brick and frame houses were found in every neighborhood, surrounded by beautiful flower gardens or lawns. Thorough tillage and the extirpation of useless weeds and briars were then the rule, where now we too often find these things the exception. Farm improvements have been greatly impaired, and much valuable soil has been taxed by a slovenly system of tillage, through the "share system" of cropping with lazy, indolent laborers, so as to become almost unproductive. In consequence of this state of things, the rich lands of Christian are slow to recover from the shock of the war. The very magnitude of some of the improvements, and the large areas of the farms, and the extensive lines of fences, required large sums of money and much labor to keep them up. This capital was not within the reach of the land-owners, and, consequently, this cause has greatly affected the prices and value of many of the first-rate farms in the county.

Within the last two or three years, however, a reaction is beginning to take place, and once more there are signs of life and thrift beginning to appear in the country, and the spirits of the farmers are beginning to rebound after fifteen sad years of depression. The labor is becoming more reliable, the people are learning better how to manage the freedmen labor, and the freedmen are learning better the obligations of a contract, and how to economize their time and the products of their industry.

What is Needed.—The people need to learn how to cultivate less land and *make it richer*, so as to raise larger crops with less labor. They must become educated how to *fertilize* with mineral and chemical fertilizers, for which the level "barren lands" are so beautifully adapted. The large farms must be cut up into small ones, and these made rich, so as never to produce less than from 1,000 to 1,500 pounds of tobacco per acre, nor less than thirty bushels of wheat, rye, or oats, nor less than from fifty to seventy-five bushels of corn. (Read the chapters in this Report on Fertilization and Fungi.) The planters need more labor and better labor, such as they have in Illinois or Ohio, or else to learn how to improve the labor they have with them, by making equitable bargains, and then paying *cash wages* promptly, on the square, upon the very day it falls due, so as to keep up a perfect confidence between employer and employe. Then there will be no trouble in getting the laborers to do their duty. There is great need of turnpike roads concentrating at the county seat, so as to preserve the wagons, and save the mules and hores of the farmers. There is special need for a narrow-gauge railroad, that will not cost over \$6,000 per mile (when well ironed), from Hopkinsville through the county to Dover, Tennessee, or to join the Clarksville and Memphis Railroad, so as to concentrate all the tobacco, wheat, and trade of South Christian and Trigg, and the county of Steward in Tennessee, at the city of Hopkinsville. The farmers need to pay more attention to sowing clover and small grain, so that one half of the open farm lands may always be in clover pasture, a part of which each year can be turned under in a green state for wheat. More suggestions might be added did space permit.

CLARK COUNTY.

In the year 1792 this county was formed out of parts of Bourbon and Fayette counties, and named in honor of General George Rogers Clark. It is bounded on the north by Bourbon, east by Montgomery and Powell, south by Estill and Madison, and west by Fayette county. Like other rich counties of Central Kentucky, Clark is the home of a most intelligent, refined, and well-educated population, and has been the birth-place or residence of several of the most prominent and famous citizens produced by the Commonwealth.

Geology and Soil.—The larger portion of this county (the west and northwest parts) lies upon the lower Silurian formation, and contains some of the best lands in the State. The northeastern part of the county belongs to the upper Silurian, and is more hilly and broken, and not so fertile, yet produces well the cereals and grasses, and excels in fine fruit. Much of the east and southeastern parts of the county is underlaid by the Devonian and Waverly rocks, which give the country a hilly appearance, and either “sobby beech” or thin oak lands.

In some few places the black Lingula shale outcrops, but nowhere do the rocks reach the coal series; consequently all search for coal in the hills of Clark county will prove fruitless. There is doubtless some iron ores in the eastern part of the county, but not in quantities sufficient to justify working.

The best lands adjoin Fayette and Bourbon counties, in the west and northwestern part of the county. Near the mouth of Howard's creek, on the Kentucky river, there has been a “fault” or dropping down of the rock strata of about three hundred feet. This brings to the surface the beds of the Kentucky river marble, which present a vertical cliff of about ninety feet. On the south side of this fault are the ordinary blue limestone ledges. There are also, in this immediate section, beds of magnesian limestone, interstratified with the marble, about one hundred feet above the water-level, which make excellent durable building stone. These are in layers of from eighteen to forty inches thickness, and are of variegated and buff colors. These rocks are soft and easy to cut when first quarried, but harden by exposure to the atmosphere, a quality highly advantageous in materials for construction purposes. In the

better portions of the county, the strata of the blue limestone are thin, with occasional marly partings, similar to those of Woodford, Franklin, Fayette, and Bourbon counties, which is always a good indication of hemp land of the best quality. The sobby beech lands, of the eastern part of this county, could be greatly benefited by tile-drainage, and also by fertilization with land plaster, ashes, German kainit, and superphosphates. The eastern part of the county abounds in mineral and oil springs.

Water-courses and Water-power.—The Kentucky river lies between Clark and Madison counties, and affords navigation when the dams are in order. Red river, between Clark and Estill, is sufficiently large to be made navigable by slack-water, otherwise it could be made to furnish a large amount of water-power for mills, furnaces, and factories. Boone, Lulbegrud, Stoner, Strode, Howard's Upper, Howard's Lower, Two Mile, and Four Mile creeks, are all nice streams, and afford many good mill-sites, and excellent drainage to the country.

Transportation and Railways.—Until recently the people of Clark depended entirely on the Kentucky river for transportation, which answered well, while the locks and dams were in good repair; but since the building of the Elizabethtown, Lexington, and Big Sandy Railroad, in 1872, through the centre of the county, which gives daily trains through to Louisville, most of the freight and passenger business takes this route. The entire county is filled with macadamized turn-pikes concentrating at Winchester.

Crops and Fruit.—Corn, wheat, oats, rye, barley, tobacco, hemp, and flax are the principal crops cultivated, and some of these have not been in much favor since the war. Blue-grass grows most luxuriously for pasturage, and orchard-grass, redtop, timothy, millet, clover, and lucern all do well for hay or meadow crops. Constant cropping, without fertilizers, has lessened the capacity of the lands for yielding such crops of corn, wheat, hemp, and tobacco as they were wont when the country was new; but a skillful application of chemical fertilizers would easily and cheaply restore any well-located soil in this county to more than its virgin richness in plant food. Fruit will do well in any part of the county, but particularly on the thinner soils and hills of the eastern parts. Here, too, grapes can be made to flourish equal to those found in many parts of Europe, and wine-making from such native varieties as the Ives Seedling, Concord, Catawba, Delaware, Hartford Prolific, &c., could no doubt be made very profitable.

Live Stock.—Clark county lies immediately within the fine stock-growing region of Kentucky, and upon her fine blue-grass lands are raised some of the best grades of horses, cattle, mules, sheep, and swine produced in America. The thin hill lands of the east and south-eastern parts of the county are peculiarly well adapted to sheep husbandry. Crosses of the Cottswold and Merino, or the common stock of the country, flourish exceedingly, and give fleeces that will compare favorably with those of any part of the United States. Bee culture has never been followed as a special industry; but the number of swarms found in the hollow trees of the forests, and the yield from the domesticated hives at nearly all the farm-houses, prove that the climate and bee food are well adapted for the production of honey. Poultry of all kinds do as well here as in any part of the Western States. The export of live stock from this county equals any other in proportion to population.

TOWNS AND VILLAGES.

Winchester, the county seat, is located about the centre of the county, upon the Elizabethtown, Lexington, and Big Sandy Railroad, and has a population of 1,700 persons. The court-house is one of the best in the State. There are three large seminaries or high schools, eight to ten churches, about forty stores and groceries, carriage factory, steam mills, and fifteen to twenty mechanic shops. The private residences are good, and many of them elegant. The people are intelligent, hospitable, and polished in their manners, and quite alive to the necessity of having emigrants come and settle among them. Kiddsville, Schollsville, Vienna, Ruckerville, and Pinchem are interesting villages, doing the local trade of rich and prosperous neighborhoods.

Manufactures and Commerce.—Clark has always been a central point for fine stock, and the exportation of the improved breeds has been so large that little else was ever looked to by her people for money profit. The commerce of the county was the outgrowth of the hemp, corn, wheat, and stock crops, and the manufacture of all kinds of goods and wares was neglected by the citizens, except that, before the days of railroads, every family made their own jeans, linsey, tow and linen cloth, and such articles of every-day wear as was used by the farming classes of the country. Then the spinning-wheel and looms were well-known household furniture; but now these have become obsolete, and the fair daughters of Clark county will know them no more forever, except by tradition from their grandmothers and mothers. Some home-knit socks,

counterpanes, and blankets are made in the southeastern end of the county, but these are also falling into disuse, owing, doubtless, to the increased wealth and pride of the people. Maple sugar, molasses, honey, beeswax, eggs, and poultry, however, still are popular among the farmers, and are the basis of much traffic with the country merchants and at the railroad depots.

Churches.—The principal denominations of Christians are the Baptist, Presbyterian, Reformer, Episcopalian, Methodist, and Catholic, with occasional members of Unitarian and Universalist. Many of the churches are very fine specimens of architecture, and generally the people of every neighborhood have their churches well attended. No county in the State contains a more religious or moral community than Clark.

Schools.—Winchester has, for nearly a half century, been noted for her female high schools and seminaries. It has two female and one male academy, equal to any similar institutions, each well-patronized by the citizens of Clark and the adjacent counties. The State free school system prevails in every school district, and a good opportunity is offered to every child to obtain a good common school education at but little cost.

Immigration.—The people of Clark county desire to have emigrants from Europe and the States of the Union to come among them, and partake of the bounties which nature has spread over this county so lavishly, in the shape of rich, fertile lands, a mild, healthful climate, excellent timber, good water, and all kinds of building material; and to all such as may seek homes here they will give a true Kentucky welcome.

What is Needed.—The farmers want more light on the best method of fertilizing and preserving their lands, so as to keep them rich, and so as to produce larger crops with less labor. They also need a further subdivision of farm labor, so as to cultivate more potatoes, grain, fruit, and grapes. Wine-making could be a leading industry, if well attended. (See wine-making, under the head of Washington county.) New York State sells annually over \$110,000,000 worth of dairy products, through the agency of co-operative dairy associations, and yet she has not a single county that will average equal to Clark in either a grass-growing or corn-producing soil. Why cannot the farmers of Clark and the other blue-grass counties equal the grazing counties of New York in the manufacture of butter, cheese, and condensed milk? Read *Dairying*.

CLAY COUNTY.

This county was formed in 1806 from parts of Madison, Knox, and Floyd, and named in honor of General Green Clay, and is bounded on the north by Jackson, Owsley, and Perry, on the east by Perry, on the south by Harlan, Bell, and Knox, and on the west by Laurel and Jackson counties.

Soil and Geological Formation.—The carboniferous rocks underlie the entire area of this county. Coal and iron ore exist in large quantities in every section of the country. The *Burning Spring* is a remarkable curiosity and phenomenon not met with elsewhere. It is thus described by Dr. Owen: "Through a pool of water, in a narrow bottom, a constant stream of gas escapes in copious volumes. A match lighted suffices to set the gas on fire, which flashes instantaneously in numerous jets across the pool, continuing to burn until the force of the gas or a gust of wind blows it out. Judging from the color of the flame and the odor of the gas, it appears to be a mixture of heavy and light carburetted hydrogen, with some free or uncombined hydrogen." This spring of gas has been continuous in its flow for over one hundred years, and how much longer no one can tell. Burning gas has been frequently met with in boring for salt or oil, as, for instance, in Meade county, Kentucky, and in the oil regions of Pennsylvania, but no pool similar to that in Clay county.

Salt wells abound along Goose creek and on the south branch of the Kentucky river; and no doubt good salt water, varying in strength, can be found in any portion of the county, if the boring is carried down to the proper sandstone, which overlies the sub-carboniferous limestone. The face of the country is hilly and mountainous. Spurs from the Kentucky ridge and Cumberland Mountains extend into this county. The soil on the north side of the ridges and in the creek bottoms is exceedingly rich, while the ridges are rocky and poor. The iron ores and coal have never been utilized to any great extent, owing to the want of facilities for transportation. For many years the people of this part of the State have been trying to get the slack-water system of navigation on the Kentucky river and her tributaries, so as to afford water carriage for the immense wealth of timber, iron, and coal in which the country

abounds, but as yet they have not succeeded. In the future, no doubt, this will be done; and all these resources, now comparatively unknown, will then be developed and added to the wealth of the State.

Salt-Works.—The most extensive salt-works in Kentucky are in this county, where over 150,000 bushels of salt are made every year. The waters are so strong that they yield from three quarters to one and one quarter pounds of salt to the gallon, while the supply appears to be inexhaustible. The depth of the wells vary from 120 to 600 feet, the strongest brine being found at the greater depth. General Garrard bored over 1,100 feet, but did not get any better water. The best wells are on South Fork of Kentucky river and on Goose creek.

Timber.—This is one of the best timbered counties in Kentucky. Here are found large forests of the best hard and soft wood, such as walnut, oaks, cherry, locust, holly, hickory, pine, hemlock, chestnut, sugar-tree, maple, elm, cedar, cottonwood, poplar, butternut, willow, birch, beech, elder, wahoo, ironwood, sassafras, hornbeam, gum, &c., &c. The amount of walnut and cherry alone of the county, if sold in an European market, would make Clay one of the richest counties in the State.

Crops and Fruit.—Corn, wheat, barley, oats, hay, flax, and tobacco grow well on the better lands. The exported crops are small, owing to want of transportation, but enough is produced for home consumption, and quite a large surplus could be spared each year, if there was a convenient market. The soil, climate, and elevation of the county particularly adapt it to the growth of fruits of all kinds, which seldom fail to make a full average crop. Grapes are a natural growth of the land, and vineyards planted and well attended would yield excellent berries and produce a wine and brandy equal to the best brands of France or Spain. The hardy native vines are better than the European stocks, producing larger crops and better flavored grapes. The Concord or Hartford Prolific could be made to produce over ten thousand pounds of grapes to the acre, and more than seven hundred gallons of excellent wine.

TOWNS AND VILLAGES.

The good citizens of this county are not given to the sin of concentrating in large bodies and crowded communities, but prefer the country scenes and pure mountain air. We find, therefore, not many towns or villages. *Manchester*, the county seat, is quite a handsome town of about one hundred and fifty persons, situated on Goose creek, about the

centre of the county. It has a good court-house, fine seminary, several handsome churches, two hotels, quite a number of mechanic shops and wagon factories, and several comfortable private residences. The trade, though local, is quite large for a place of its size, and, like Manchester, England, for which it was named, its natural facilities for a large manufacturing city are excellent, if ever transportation facilities are supplied. *Laurel, Big Creek, Seaton's Creek, and House's Store* are nice, flourishing villages, with good local trade.

Schools and Religious Societies.—The common school system of the State is effective in every district in the county, and the schools are generally well attended. The parents are taking a lively interest in education, and begin to feel the necessity of having their children taught the rudiments of a good education. *Clay Seminary*, at Manchester, is an excellent institution, under the able management of Prof. Samuel Harris and other competent teachers. The Methodists, Primitive and Free-will Baptists, and the Reformed Christians are the principal denominations of Christians. The church buildings, except in Manchester, are generally of the native style of architecture, unadorned by expensive or showy cupolas or loud-sounding organs, the devout congregations feeling that more true piety is to be found in earnest faith and honest hearts than in the sermons of high-salaried priests or stately church buildings.

Home Industries.—The sensible, industrious women of Clay are the true source of its manufacturing energies. They still ply the shuttle, hold the distaff, and chant to the chorus of the spinning-wheel. Flax, wool, and cotton are grown for home consumption, and large quantities of home-made jeans, linseys, linens, and cottonade, socks, &c., are manufactured by the old process of hand labor. Besides this, there are produced, for home consumption and traffic, large quantities of butter, eggs, chickens, ducks, geese, turkeys, guineas, feathers, beeswax, honey, ginseng, maple sugar, molasses, shuck and bark collars, leather, home-made shoes, &c., &c. The people are intelligent, hospitable, and anxious to have emigration come in and settle on the vacant lands, and make the waste places bloom and blossom as the rose.

CLINTON COUNTY.

This county, named in honor of DeWitt Clinton, of New York, was formed in 1835 from parts of Wayne and Cumberland counties, and is bounded on the north by Russell, east by Wayne, south by Tennessee State line, and west by Cumberland county.

Geological Formation.—The geology of this county is varied. Here can be found the Waverly, the sub-carboniferous, and true coal measures. But a small portion of the county has coal, viz: the eastern part next to Wayne county, and the southeast next to the State of Tennessee. There is a considerable quantity of iron ore in the coal measures, and some in the other formations, but probably not enough for profitable working. The face of the country is undulating, and in many places hilly. The Poplar Mountains make a rough surface, though they afford much excellent grazing country, particularly for sheep. The cavernous limestones, the same as we find in Barren county, outcrop and become the surface rocks in more than half of the county. These overlies a shale and sandstone in which, no doubt, coal oil and salt water can be found in the same abundance that they are in Cumberland county, but it would require deeper boring. The Cumberland river on the north and Obey on the south, with its branches, make Clinton county appear as a backbone to the two valleys, which, in fact, is the case; these two rivers and their tributaries have taken their courses from the position of the Poplar Mountain ridge. Stockton's valley, which occupies the level lands in the mountain's curve, presents a beautiful section of country, based upon the Lithostrotion limestones, capable of producing excellent crops of cereals and tobacco.

Rivers and Creeks.—Cumberland river runs through the northwestern part of the county for a short distance, with deep banks, the low water reaching the Silurian rocks. Wolf creek, Indian creek, and the branches of Obey river, all afford good mill-sites, owing to the great fall from their sources to the Cumberland river, where they empty.

Soils and Crops.—The face of the country being generally rough and hilly, gives great variety of soils; the valley or "level barren" parts are quite fertile, as are also the creek and river bottoms; but much of the ridges and high hill-sides are rocky and poor. On the better lands corn, wheat, oats, barley, rye, buckwheat, and hay, grasses and tobacco, do

well and make fine crops. The hilly country is peculiarly well adapted for orchards, vineyards, and sheep husbandry. Apples, pears, peaches, plums, cherries, quinces, and all classes of nuts and berries, rarely ever fail to produce good crops, and grapes grow as large and luscious as they do in the south of France. Proper care with Concord, Ives Seedling, Hartford Prolific, Delaware, Catawba, &c., &c. (native grapes), would give a wine rich in saccharine matter, and of a "bouquet" that could not easily be excelled.

TOWNS AND VILLAGES.

Albany, the county seat, is located about the centre of the county, and has a population of two hundred persons. It has a fine courthouse, jail, and clerk's offices, several factories, and steam mills for flour, lumber, woolen cloths, leather, and other products of mechanical labor, good churches and school-houses, and comfortable private residences.

Seventy-six is a neat village, situated on Indian creek, at the falls, where there is a fine merchant mill and saw-mill, a store, and several mechanical shops.

Cumberland City is located at the Short Mountain coal mines, and contains about three hundred people, two stores, good churches and school-houses, and several wood factories and mechanical shops. A large trade is carried on at this point with the adjacent country and miners.

Clark's Cross-roads has a store, blacksmith shop, and wood workman.

Schools and Churches.—Nearly every public school district is now supplied with a teacher, and the system has become generally used by parents seeking to have their children taught the rudiments of a common school education. Besides the common free schools, there are several private schools in the county, where higher branches are taught to those desiring them. The Primitive or Hard-shell Baptists, the Free-will Baptists, the Methodists, and the Reformers are the chief denominations in the county. There are several very fine churches, but the majority of the "meeting-houses" are more humble in their pretensions, the good Christian people feeling that true piety can as easily come from a log meeting-house as from a gilded chapel.

Live Stock.—As yet not much attention has been paid to fine breeds of stock: the "razor-back," "long-faced" swine still being very popular among the hills of Clinton, owing to their known ability and self-

reliance in searching for angelica and sweet-brier roots, which could never be reached by the short-headed, chubby-faced Berkshires. The scrub cattle, too, many think, "suit the hills and hollows," and the native sheep, they imagine, do best in the wild pasturage. We hear, however, that several public-spirited farmers have determined to change the breeds, and are introducing the fine-blooded stock of every kind from the blue-grass counties, and will ere long show that no place can produce better stock than Clinton county. Sheep husbandry could be made pay as well here as in any part of the world.

Domestic Arts.—The good ladies of Clinton county have long been noted for their industry in manufacturing at home all kinds of jeans, linseys, flax and tow linen, counterpanes, coverlets, quilts, comforts, blankets, flannels, socks, and other valuable domestic articles of common wear. Besides, they market largely dried fruit, eggs, butter, chickens, turkeys, geese, ducks, and feathers. The music of the wheel and loom still echoes to the merry songs of the contented, rosy-cheeked, healthy maids and matrons, who are not cursed with the dyspepsias and sallow looks of their fashionable, idle, pain-suffering sisters of the cities. Fortunately for the race of man, it is from these healthy, stout, robust, life-loving matrons of the country that the majority of our population springs; otherwise, we would, in a few generations, become a race of hypochondriacs and invalids. Nature seems to understand this; so that while the effeminate die out, the "fittest survive" to reinvigorate and keep up the standard of improvements.

CRITTENDEN COUNTY.

This county, located in the western part of the State, immediately on the Ohio river, was formed from a part of Livingston county in 1842, and named in honor of John J. Crittenden. It is bounded on the north by the Ohio river, which separates it from the State of Illinois, and by Union and Webster counties, east by Webster and Caldwell, south by Caldwell and Lyon, and west by Lyon and the Ohio river.

Geology, Minerals, and Soil.—The surface of the country is generally high, broken, and rolling, and is based upon the sub-carboniferous lime-

stones and coal measures. The northeast part of the county, next to Tradewater river, contains good coal beds, which are extensively mined, and the products sold on the Ohio river and elsewhere. The balance of the county is located entirely upon the Lithostrotion or sub-carboniferous limestone. In this latter formation numerous veins of lead ore, intermixed with calc. spar and fluor-spar, have been found, and shafts sunk to test their quality. Several mining companies have been formed to work these veins for the lead, zinc, silver, and fluor-spar which they contain; but up to this time no very extensive works have been established, nor has much regular mining been done. Similar deposits of these metals are found in Caldwell and Livingston counties, in Kentucky, and the adjacent counties in Illinois, and in the latter State these deposits are being worked quite extensively. A large portion of the surface soil is very rich and productive, and well adapted to all the cereals, tobacco, and fruits. It is one of the finest fruit regions in Kentucky or the West. Apples, peaches, plums, cherries, and grapes all grow to perfection. Some of the most hilly parts of the county present the thin but generous soil usually found upon similar geological formations.

Streams.—Crittenden county is nearly surrounded by good navigable streams. The Ohio forms half of its northern boundary; the Tradewater its entire northeastern and part of its eastern, and the Cumberland its southern border. Besides these, it has several good mill streams or creeks, of which the principal are Crooked, Camp, Hurricane, Livingston, Piney, and Deer creeks.

Timber.—Crittenden is one of the best timbered counties in the State. It abounds in native forests, which still occupy over 70 per cent. of the lands. The prevailing growths are walnut, hickory, butternut, pecan, cypress, gum, poplar, all kinds of oaks, ash, maple, sugar-tree, box-elder, locust, hornbeam, wild cherry, leatherwood, sassafras, cottonwood, willow, beech, persimmon, birch, and redbud. Nuts, berries, and small wild fruits abound, and the sweet and bitter mast frequently supplies food for hogs during the entire fall and winter months. Lumbermen have exported a large amount of logs, plank, and staves from this county, which are taken to all parts of the West and South, as well as to the European markets.

Crops and Fruits.—Corn, wheat, rye, oats, and tobacco are the chief farm staples, and herds-grass, timothy, clover, orchard-grass, Hungarian, and millet are the principal hay and meadow crops. The climate

and soil are so propitious that, with good cultivation, there is never a failure in the crops of this county, and the farmers are generally well rewarded for their care and labor. Turnips, ruta-bagas, beets, sorghum, potatoes (Irish and sweet), ground peas, artichokes, chufas, and melons of all kinds flourish here exceedingly, and garden vegetables grow to perfection. Fruits of all kinds, particularly apples, peaches, pears, plums, and berries, grow as well and mature as perfectly in Crittenden as in any section of the State. Grapes are native to the soil, and several varieties grow wild. So far as vineyards have been tried they do finely, and the American "star varieties," such as the Concord, Ives Seedling, Delaware, Hartford Prolific, Catawba, &c., &c., rarely fail of a full average crop. Flax and cotton are raised for home use.

Mills and Factories.—There are numerous water and steam grist and saw-mills located in different neighborhoods, which manufacture meal and flour, and saw lumber for local consumption and some for export. Several large tobacco stemmeries and factories convert the leaf tobacco into "strips," or else re-handle it and prepare it for sale in the different markets to which it is exported. A large amount of home-made cloth is still manufactured by the industrious women of this county, both for home consumption and traffic. The cotton-cards, the spinning-wheel, the distaff and hand-loom, are still common articles at many farm-houses, and the specimens of jeans, linsey, linen, counterpanes, blankets, and other cloths produced would do honor to skilled manufacturers.

Smaller Industries.—There being no large towns or cities within reach of this section, the people have paid but little attention to garden farming, yet a considerable amount of eggs, poultry, butter, feathers, bees-wax, maple sugar, and molasses are every year traded to the local merchants, and by them exported to the larger markets. Dried fruit, such as apples, peaches, cherries, pears, blackberries, &c., are put up in quantities every year by the females on the farms, and traded to the merchants for dry goods.

Live Stock.—Until within the last few years no fine-blooded stock was raised in this section, but now such public-spirited men as Major A. H. Cardin, J. H. Hill, R. Noe, and others, seeing the necessity of producing better classes of hogs, cattle, sheep, &c., have turned their attention to procuring better breeds, which are gradually spreading over the county, so that within a few years no county south of Green river will contain better stock than Crittenden. Large numbers of hogs are driven in a fattened condition every year to the river and railroad, and

shipped to Louisville or elsewhere, and many beeves, mules, and horses are taken annually for market to the Southern Cotton States. The business of stock-raising can be greatly improved and increased, and be made a leading and profitable industry in this portion of the State.

TOWNS AND VILLAGES.

Marion, the county seat, is situated near the centre of the county, has a fine court-house, several elegant churches, a male and female academy, good store buildings, half a dozen mechanic shops, two tobacco stemmeries, and a good mill. The population is about five hundred.

Dycusburg, fifteen miles from Marion, on the Cumberland, is a very important shipping point for the wheat, corn, live stock, and tobacco of the southern portion of the county. It contains several tobacco stemmeries and warehouses, a good church, and about three hundred population.

Weston, *Ford's Ferry*, and *Clementsburg*, on the Ohio river, are all flourishing villages, and each do a large shipping business.

Bell's Mines, on Tradewater, is a celebrated mining town, from which large quantities of coal are shipped to all points on the Ohio and Mississippi rivers, south of the mines.

Shady Grove, in the eastern part of the county, is a neat village, doing a large local trade.

Schools.—There are two flourishing academies at the county seat (male and female), each well patronized by the people of the vicinity, under the charge of well educated, competent professors. The common school system of the State extends to every district in the county, and there is much interest taken by parents to have their children partake of its benefits.

Churches.—The Baptist, Presbyterian, Methodist, Reformer, and Catholic are the principal denominations of Christians, though members of other churches are to be found throughout the county. The church buildings in the country, though not elegant, are very comfortable, and the congregations usually attend in good numbers.

Local Characteristics.—The people of Crittenden county are intelligent, industrious, and thrifty, and a more hospitable, kind, and social community cannot be found in Kentucky. They want emigrants to come and settle among them, and to all such they will throw out the latch-string and bid them welcome.

CUMBERLAND COUNTY.

This county was formed in 1798 from a part of Green, and named for the Cumberland river, which flows diagonally through the county from northeast to southwest. It is bounded on the north by Metcalfe and Adair, east by Russell and Clinton, south by the Tennessee State line and Monroe county, and west by Monroe and Metcalfe.

Geology and Soil.—The Cumberland river and its tributaries cut through every rock formation, from the upper coal formation until, in this county it reaches the Cambrian or lower Silurian blue limestones. A small part of Cumberland county lies on the sub-carboniferous Lithostrotion limestone, but the largest portion of the county is based upon the Waverly series, which are cut through by the rivers and creeks so as to expose the Devonian shales and the upper Silurian in thin stratifications, and the lower Silurian (Cambrian) blue limestones in the beds of the rivers. There appears to have been much disturbance in these formations, probably by "faults" or a succession of earthquakes, at an early period in their formation. There is no coal in the county; but coal oil in large paying quantities has been found by wells sunk in the river and creek bottoms. The first noted "American Oil" well ever bored in the United States is situated three miles from Burksville, on the banks of the Cumberland river. The oil was struck by a party boring for salt water, in the year 1830, at the depth of one hundred and seventy-five feet, and spouted up to the height of fifty feet above the surface. This oil well continued to run for many years, and the product was sold under the name of "American Oil," to be used as a medicine in curing rheumatism, burns, scalds, neuralgic affections, &c. At that time no one knew of the lubricating and burning properties of coal oil. Salt water abounds in this section, and some iron ores, but not in such quantities as in several of the neighboring counties lying to north and east. The general surface of the country is hilly and broken, and abounds in knobby formations of thin soil, but with bottoms of great fertility. There is much sobby beech land that might be greatly improved by the application of lime and tile-drainage, gypsum, German kainit; ashes and the superphosphates could also be used profitably on the level lands in this county, and would materially add to their productiveness. There is much excellent building rock in this section of the State, which may some day become valuable.

Streams and Water-power.—Cumberland river, which is navigable by steamboats, drains this entire county by means of numerous tributaries, which (on account of the kinds of rocks over which they flow) afford some of the finest mill-sites and water-powers to be found in the State. The principal of these are Marrowbone, Crocus, Big Renick, Little Renick, Miller's, Wells, Crow, Bear, Otter, and Goose creeks. Coal oil wells have been sunk, and oil and salt water found, along several of these streams.

Timber.—This county was well timbered, more than half of which still remains in the native forests. The best quality of oak, poplar, and chestnut abounds, besides walnut, cherry, maple, ash, sugar tree, linden, gum, ironwood, hornbeam, hickory, butternut, and the various other hard and soft woods indigenous to this latitude. Wild nuts, berries, grapes, plums, and persimmons are plenty, and show the adaptability of the soil and climate for fruit culture.

Crops and Fruits.—Corn, wheat, oats, rye, and tobacco are the chief staples. Cotton, flax, potatoes, and buckwheat are raised for home use. The principal grazing and hay grasses are clover, redtop, timothy, orchard-grass, blue-grass, Hungarian, and millet. Fruit of all kinds flourish here as luxuriantly as in any part of the State. Peaches, pears, apples, plums, cherries, quinces, apricots, nectarines, and grapes scarcely ever fail of making a full crop. The wild vines which grow everywhere throughout the county indicate, what experience has proven to be a fact, that vineyards and wine-making can be successfully carried on upon all the lands in Kentucky of a similar geological formation with those of Cumberland county, and nothing but a fair trial is needed to convince the farmers that this industry will pay. The lands and cropping in this county are each susceptible of great improvement by a proper system of drainage, cultivation, and fertilization.

Live Stock.—Much improvement is making in the breeding of all kinds of stock since the war. The scrub cattle, however, still form a large majority, and the razor-back swine still holds in some localities undisputed possession of the "big mast pastures," and seeks a living, as his ancestors did, among the sweet-brier roots, angelica, and wild pea vines without let or hindrance. The common sheep, too, is predominant; but all these are gradually giving way to the Short-horn, Berkshire, Poland China, and Cottswold and Merino, which the far-seeing, wide-awake farmers are introducing year by year. Sheep husbandry can be made to pay as well in this county as it can in any part of the

Mississippi Valley; and the day is not far distant when this will be one of the most profitable industries of Cumberland. Bees do well; and, although only a few hives are kept by farmers for home use, yet honey is plenty, and costs almost nothing.

Domestic Arts.—The good old custom of wearing home made clothes is still kept up, to a considerable extent, in this section; and the energetic, industrious women, who are here (as they are almost everywhere) the “salt of the earth,” do almost all the work in making cloth and clothing for the family. They card, spin, and weave, as their mothers did, and are not ashamed to chant an accompaniment to the buzz of the wheel or the sound of the loom. They make large amounts of jeans, linseys, cottonades, linens, blankets, counterpanes, and home-knit socks, and, after supplying the family, have a surplus to traffic or to trade with the merchant for groceries and “store goods,” never forgetting the duck of a bonnet or the jaunty hat and hoop-skirts for the blooming daughter. They also traffic largely in poultry, eggs, butter, beeswax, ginseng, maple sugar, and tree molasses, and frequently do more than one half towards supporting the family and enriching the “head of the house.”

TOWNS AND VILLAGES.

Burksville, the county seat, is handsomely located on the north side of Cumberland river, about the centre of the county, and contains a population of about 400 persons. It has a good court-house, several pretty churches, many neat private residences, a dozen commodious stores and groceries, eight or ten mechanic shops, large grist and saw-mill, tobacco factory and warehouse, and is the seat of *Alexander College* and a high school under the management of the Christian Church.

Marrowbone, *Peytonsburg*, *Big Reno*, *Fanny's Hill*, and *Pace's* are neat villages, each doing a considerable local trade.

Schools.—In 1872 *Alexander College* was chartered and located at Burksville, under the presidency of Rev. J. P. McMillan. It has an endowment of several thousand dollars, a library of over 1,000 volumes, and about 100 students. The Reformers have a high school at the same place, well patronized by the citizens and the people of the country. The State system of public schools has been inaugurated in every school district, and the people show a commendable pride in having their children accept of its advantages.

Churches.—The Reformer, Methodist, Baptist, and Presbyterian are the chief religious denominations, although professors in other churches are scattered through the country. The church buildings are not ele-

gant, but roomy and comfortable, and there are generally one or two located in every neighborhood.

Social Characteristics.—The people are generally very intelligent, industrious, and thrifty, and nowhere can be found a more social, hospitable community. The excesses of fashion and aristocratic life are unknown, and every person is rated according to his proper level, according to his industry, honesty, and intelligence. The citizens are anxious to have emigrants come and settle among them, and will give a most hearty welcome to all who will do so.

DAVIESS COUNTY.

In the year 1815 this county was taken from the west part of Ohio county, and called in honor of Col. Joseph H. Daviess. It is bounded on the north by the Ohio river, which separates it from Spencer county, Indiana, east by Hancock and Ohio, south by Ohio and McLean, and west by Henderson county.

Geology.—This is one of the richest landed counties in the State, and is located altogether upon the carboniferous or coal-bearing formation of the West Kentucky coal field, and has coal probably under every foot of its territory. The surface is generally undulating, except portions near Green river and Panther creek, which are flat, and in the winter sometimes covered with water. The flat lands also, in smaller bodies, are found in different parts of the county; but most of these can be reclaimed by a scientific system of drainage. The surface-soil throughout the county is a rich dark loam, much of it quaternary in formation, underlaid by an unctious red clay or a mulatto-colored clay. In plant food the soil is, when new, particularly rich, but when exhausted by bad farming, it will need fertilizers and green crops to keep it in heart. The subsoil is not near so rich in plant food as the top soil, and the rocks are deep under the surface, consequently the lands will not renew their fertility so rapidly as the lands of Woodford or Fayette counties, where the disintegrated particles of marly limestones are continually being

intermixed by deep plowing. Land plaster, lime, German kainit, and superphosphates can be used to great advantage on the exhausted lands of Daviess. There is more or less iron ores throughout this coal series, but probably not enough in any one locality for profitable working. Mineral springs and salt wells are numerous, and of excellent quality.

Streams.—The Ohio river on the north, and Green river on the western border, give uninterrupted navigation to all sections of the county for the shipment of freight and passengers. Panther creek runs from east to west through the centre of the county, and empties into Green river. Its tributaries form the principal drainage, but in many places the fall is so small that overflowed flats result. Where the fall is sufficient, good mills are established, which saw large amounts of timber for home use and export.

Timber.—Originally no county in Kentucky was more heavily timbered than Daviess, over forty per cent. of which still remains in native forests. The trees are, in many instances, of immense size, and consist of almost every variety indigenous to this latitude on the American continent. Of these, the most common are the walnut, butternut, sycamore, cottonwood, gum, hickory, ash, cherry, all kinds of oaks, sugar-tree, maple, poplar, elm, locust, wahoo, hornbeam, beech, ironwood, birch, sassafras, leatherwood, willow, cedar, cypress, holly, and linden. The undergrowth consists of papaw, spicewood, dogwood, grape-vines, witch-hazel, cane, &c., &c., in almost endless varieties. A large amount of sawed timber and logs are exported annually.

Crops and Fruits.—Corn, wheat, oats, rye, and tobacco are the chief staples, and nowhere in the State do these give larger yields or better paying crops. The principal grasses are timothy, herds-grass, clover, orchard-grass, blue-grass, Hungarian, and millet. The hay product of this county is large, and is susceptible of almost an indefinite increase. The lands are well adapted for hay, and grow as much to the acre as any part of Indiana or Ohio. The tobacco cultivated is peculiarly suited for strips, such as are used in the English markets, and under the name of "Yellow Banks Tobacco," has gained a world wide reputation. The corn is largely made into whisky, which is becoming famous throughout the United States for its excellence of quality. The different kinds of fruit, apples, peaches, pears, quinces, plums, cherries, &c., flourish well, and seldom fail of making an average yield. Grapes do well on the hill-sides and ridges, and, if the lands were properly tile-drained, would no doubt produce equal to the most favored parts of the country.

Mills and Factories.—Steam and water, saw and grist-mills, are to be found in every neighborhood, which give employment to many hands, and supply meal, flour, and lumber for home use and export. Wool factories, carding-machines, tobacco factories, and mechanic shops are scattered throughout the county, and at Owensboro are at work on a large scale. The tobacco factories and stemmeries of Owensboro handle nearly the entire crop of Daviess, and much from the adjacent counties of Kentucky and Indiana, and large fortunes have been made by the tobaccoists. Various other manufacturing establishments are every year entering the lists, as the country becomes more developed and capital and skilled labor increase.

Smaller Industries.—The old plan of clothing the family in home-made cloth is fast disappearing as the people become more wealthy and proud; yet, in many families, the spinning-wheel and hand-loom still hold their position, and the industrious ladies continue to make large quantities of jeans, linseys, linens, blankets, &c., for home use and traffic. They also market quite extensively poultry, eggs, butter, beeswax, feathers, dried fruit, maple sugar, tree molasses, ginseng, and home-knit socks, while the men attend to the crops of the farm and the live stock.

TOWNS AND VILLAGES.

The city of *Owensboro*, the county seat, beautifully located on the bank of the Ohio river, one hundred and fifty miles below Louisville, is one of the most flourishing places in the State, and contains about eight thousand population. It contains a fine court-house and other public offices, and gas-works. There are several handsome academies and high schools, from fifteen to twenty tobacco factories and stemmeries, planing-mills, breweries, grist and saw-mills, woolen factories, barrel factory, marble yards, tanneries, six or eight large distilleries, and many other mechanical factories and shops. The stores are elegant, and as well ordered as those of the larger-sized cities. The private residences are good, and many of them beautiful in structure, finish, and location. The trade and commerce is much larger than is usually done in a city of its size, and rapidly increasing each year.

Whitesville, fifteen miles east of Owensboro, is a handsome town of three hundred population, and does a large local trade. *Yelvington*, *Knottsville*, *Oakford*, *Masonville*, *Sorghotown*, *West Louisville*, *Pleasant Ridge*, *Delaware*, *Curdsville*, and *Birks City* (the last three on Green river), are all neat, thriving towns, of from one hundred to two hundred

and fifty inhabitants, and each one the centre of a large neighborhood trade.

Live Stock.—So completely have the farmers of Daviess been absorbed in the cultivation of corn, wheat, oats, hay, and tobacco, that they have paid comparatively but little attention to the breeding of fine stock; yet such is the fertility of the lands in producing grass, hay, and corn, that, in spite of their neglect, the county exhibits good breeds of native horses, mules, cattle, hogs, and sheep. Of late years, more attention has been given to the pedigrees of horses, cattle, sheep, and hogs, and many fine blooded animals, of each kind are to be found among the planters, which trace back to the best bloods in the Blue Grass Region. Sheep husbandry is on the increase, and excellent wool is produced each year and sold to exporters. In the woods can be found wild bees in abundance, which in the early settlement of the country supplied the people with honey sufficient for family use. The farmers now generally keep a few stands, which flourish with but little attention.

Schools.—There are in Owensboro and other parts of the county several academies and private schools of decided merit, usually under the charge of different Christian denominations. There is also at Owensboro the public school, divided into three departments—the primary, the middle or intermediate, and the high school, all under the management of trustees and able professional teachers. The public schools are taught in nearly every school district in the county, under the State system, and the people are taking more pains in having their children educated than at any former period.

Churches.—The Catholics, the Baptists, the Reformers, the Methodists, Presbyterians, Lutherans, and Universalists, are the principal denominations. In Owensboro, Knottsville, West Louisville, and Whitesville, the Catholics are the most numerous sect of Christians, and have many elegant, costly churches. Elsewhere, the different sects are about evenly divided. The church buildings in the city of Owensboro are very fine, and in the country are well built and comfortable. The congregations usually attend in good numbers, and are remarkably orderly and harmonious.

Social Characteristics.—Nowhere can be found a more refined, intelligent, social, and hospitable population than in Daviess county. Their rich lands afford them means for good living, and they do not refuse to enjoy them. The sociability of neighbors is a marked characteristic. There is no foolish pride of wealth or aristocracy, and every one is

placed in his true position according to his industry, intelligence, and moral worth. The people are desirous that emigrants shall come and settle on the rich lands, and help develop the great resources now lying idle; and to all who may think proper to do so, they give a most hearty welcome.

EDMONSON COUNTY.

In the year 1825 Edmonson county was organized out of parts of Warren, Hart, and Grayson, and named in honor of Captain John Edmonson. It is bounded on the north by Grayson and Hart, east by Hart and Barren, south by Warren, and west by Warren and Butler counties.

Geology and Soil.—About two thirds of this county is located on the carboniferous, and one third on the sub carboniferous rocks. Green river, which runs through the centre of the county, and Nolin, Bear creek, Clay Lick creek, and McClure's creek, cut through the coal measure into the Lithostrotion limestone. The northern portion of the county is entirely on the coal measures, while the south and south-eastern parts are on the sub-carboniferous barren limestone formation. The face of the country is quite variable. The barrens and the plateau of the coal measures, lying between Nolin and Clay Lick creek, are quite level, while the balance of the country is very hilly and broken. The fault that brought the cavernous limestone and the coal measures on a general level is quite easily traceable along its entire length, and presents a curious transition from rocks and soils of one geological formation to those of another. Coal and iron ores exist in large quantities, but have been little worked. The iron ores belong to the family of limonites or hydrated oxides, and are quite rich in metal. They usually lie in strata on or between beds of shale, or resting upon beds of limestone. The coal is much the same as that of Butler and Muhlenburg counties. The soil on the barren limestone is rich, and produces fine corn, wheat, oats, and tobacco; it has a red clay subsoil, which makes good rich dirt when exposed to the atmosphere and kept

loose and mellow. The bottom lands are exceedingly fertile for all kinds of crops, particularly Indian corn; the level lands of the coal measures are thin but very free, and are well suited for flax, wheat, and fine tobacco, but not well adapted to corn. The hills and ridges are generally sandy and poor.

Streams and Water-power.—Green river, running through the centre of the county, affords transportation all the year round, convenient to every neighborhood. Nolin, Bear creek, and Clay Lick creek present many fine sites for factories, furnaces, or mills, and pass through sections of country abounding in coal, iron ores, and immense forests of the finest timber.

Caves.—The sub-carboniferous limestone of the entire "barren" country abounds in caverns or caves of great size; one of these, called, from its immense extent, the "Mammoth Cave," is one of the greatest natural curiosities in the world. It is situated near Green river, in the cavernous limestone district, some eight or ten miles from the Louisville and Nashville Railroad. Our space forbids a general description of it, which can be found in all the histories of Kentucky. Dr. Owen estimates the known avenues of this cave to exceed one hundred and fifty miles in length, and the area to be not less than 12,000,000 of cubic yards of cavernous space. Horse Cave, some few miles from the Mammoth, is probably as large as the latter, if avenues could be followed. Many other caves are scattered throughout the south of this county, and in Hart, Barren, and Warren counties. The caverns are formed by the disintegration of the softer members of the limestone series, which are dissolved by the action of the water and carbonic acid of the atmosphere, which strikes them, and in this dissolved state are carried off through the underground springs, and emptied into the rivers, to be washed into the Gulf of Mexico.

Timber.—Edmonson county is one of the best timbered counties in the State. Magnificent forests of all kinds of native trees (both hard and soft wood) exist in their original condition; among these are found the poplar, gum, all kinds of oaks, cherry, walnut, butternut, cypress, ash, beech, birch, maple, sugar-tree, hornbeam, elm, cedar, cucumber tree, ironwood, hickory, redbud, &c., &c.

Fruits and Crops.—This county is particularly adapted to the growth of all kinds of fruits indigenous to the north temperate zone. Apples, pears, peaches, nectarines, apricots, plums, cherries, grapes, and nuts, and berries of all kinds, flourish and scarcely ever fail of a full yield.

Vineyards and orchards will eventually become the great source of agricultural wealth, and wines and brandy will be made here from the native grapes (such as the Concord, Hartford Prolific, Catawba, &c.), equal to the best foreign brands. The peach tree grows remarkably well on the freestone lands, and orchards of this fruit for brandy-making would pay well, the peach brandy of this region being famous for its mildness and excellent flavor. Corn, wheat, and tobacco grow finely on the bottoms and limestone lands, while wheat, oats, rye, and flax do well on the freestone. Flax is particularly suited to this soil, as well as to all other carboniferous soils, and will become a staple of great value, both for its lint and seed. Its culture has been suspended, owing to the labor of "breaking and cleaning;" but a recent patented "flax-brake" promises to remedy this trouble, and we are told can break and clean over 1,000 pounds per day at a very little cost. If this can be done, flax can always be sold in the cities as easily as hemp or tobacco for the manufacture of linen cloth, and will then become a first-class crop in the country. Chemical fertilizers could be applied with great profit to the worn or "tired lands" in this county, particularly those on the southern border. What is needed, is a compost of land plaster, German kainit or marl, or bone-dust, ashes, and salt, sown broadcast just before seeding the crops.

TOWNS AND VILLAGES.

Like many other counties in Kentucky, Edmonson contains a population essentially agricultural, who do not congregate in towns and villages, but prefer the free open space of the country, with its fine scenery and pure air; therefore, we find here no large towns or cities, but an intelligent, honest, industrious, frugal country population.

Brownsville, the county seat, is located on the south side of Green river, about the centre of the county, and contains a population of about two hundred and fifty persons. It has a good court-house, two or three nice churches, a fine academy, and several handsome private residences. The business is local, but quite extensive for the size of the place.

Big Reedy, Bee Spring, Parish Mills, Dickey Mills, and Rocky Station, are all neat villages, with good local trade, and much country traffic in domestic manufactures. The Louisville and Nashville Railroad passes through Rocky Station.

Schools and Churches.—The public school system of the State is doing well in this county, and a school is taught in nearly every district. The

people take an interest in having their children educated, and are much more desirous than formerly of having the school system to flourish. There is an excellent academy or seminary at Brownsville, under the control of an able teacher, with proper assistants. The Old School Baptists, the Free-will Baptists, the Methodists, and the Reformers are the principal Christian denominations in the county. The churches are very good in the villages, but those in the country are of the native architecture, not much adorned either to please the eye or gratify the prevalent humor for fashions, which we find in the large towns and cities. The people meet to worship in faith and good will, but not to look at fine decorations, or to listen to loud-sounding organs, either in the shape of musical instruments or high-salaried priests or preachers.

Domestic Arts and Small Industries.—As in many other counties, the manufacturing energy here belongs to the ladies, who still hold on to the old-fashioned hand-loom, the spinning-wheel, and the distaff. They seem contented and happy while they manufacture from the flax, wool, and cotton raised at home large quantities of linsey, jeans, linen, counterpanes, comforts, sheets, towels, socks, quilts, and “spun truck.” They also, after supplying the family, traffic thousands of eggs, chickens, turkeys, ducks, guineas, feathers, butter, ginseng, &c., &c., almost entirely supporting the family on the smaller industries, while men attend exclusively to the crops of corn, wheat, tobacco, and hay. Thus the greater portion of the people live within themselves, and seldom venture into speculations or the uncertainties of mercantile life, and consequently are ignorant of the meaning of the words “hard times,” as it is learned by those who inhabit the large towns and cities.

ELLIOTT COUNTY.

This county was named in honor of Judge John M. Elliott, and formed out of parts of Morgan, Carter, and Lawrence, in the year 1869, and is bounded as follows: north by Carter, east by Lawrence, south by Lawrence and Morgan, and west by Rowan.

Geological Formations and Soil.—The carboniferous rocks prevail over the entire country, except along the western margin and in the deep cuts made by the rivers and creeks; the sub-carboniferous limestones and Waverly sandstone and shale are occasionally met with. Like Carter and Lawrence, this county abounds in coal and iron ores. The coal, both cannel and bituminous, is found almost everywhere, beginning with thin beds of sub-conglomerate, and extending through the entire coal measures. The iron ores correspond to the beds of Carter, Lawrence, and Bath counties, and exist in large quantities. The only drawback to the profitable working of the coal and iron beds of Elliott county is the want of facilities of transportation. These will in due time, no doubt, be supplied, both by railroads and by slack-water navigation on the Little Sandy river and Big Blaine creek. The face of the country is generally broken and very hilly. The ridges, about the centre of the county, are the starting points for numerous creeks, flowing partly into Little Sandy and Big Blaine and partly into Licking river. The river and creek bottoms are very rich in soils, but the hill-sides and ridges are generally sandy and poor.

Streams and Timber.—Elliott county is well drained by creeks and small rivers. Little Sandy and Big Blaine, with their tributaries to the north and east, and the tributaries of Licking to the southwest, afford many fine sites for furnaces, factories, or mills; and if ever they are dammed so as to give slack-water navigation, will give easy access to immense beds of coal and iron ores, which will be extremely easy of mining and of being floated to market. The timber in this county is excellent, and consists of pine, hemlock, all kinds of oak, fir, poplar, cherry, walnut, butternut, hickory, gum, ash, cedar, locust, holly, ironwood, hornbeam, birch, beech, alder, maple, sugar-tree, cottonwood, sycamore, leatherwood, hickory, buckeye, and other kinds of growth indigenous to the mountainous regions in this latitude.

Crops, Fruit, and Stock.—Wheat, corn, oats, rye, barley, hay, flax, and tobacco grow well on the better quality of lands, and generally yield abundant crops. Apples, peaches, cherries, plums, and all kinds of nuts, berries, and small fruits, come to great perfection in every part of the country, and seldom fail of a full crop. Grapes grow here equally as well as in the most favored countries of Europe, and vineyards will some day be planted on all the eastern slopes of the hills and ridges. The native varieties, such as Concord, Hartford Prolific, Ives Seedling, Delaware, &c., &c., flourish best, and seem to stand the climate better

than the foreign vines. Wine can be made of a very superior quality, and with an exceedingly rich "bouquet," containing large quantities of alcohol and saccharine matter. From these wines and wine lees also could be made the best quality of "Cognac Brandy," equal to that of France or Spain. The live stock of Elliott county is not yet equal to that of Bourbon or Scott counties, but there has been a marked improvement made within the last few years over the times when the "scrub cattle" and the razor-back, long-snouted, wattled swine were lords of the meadows and forests. Still some farmers prefer the old kinds of common stock, because they say these "know the way" to find a sweet-brier root, or to live on acorns and cane without feeding. Better breeds of horses, mules, and sheep are being introduced, and the country has proven itself particularly adapted to the fine grade of wool-bearing sheep, so that we may expect in a few years to see Elliott county abound in large flocks of Cottswold, Leicester, Shropshiredown, and Merino.

TOWNS AND VILLAGES.

Martinsburg, with a population of one hundred and twenty-five to one hundred and fifty persons, is the county seat. It has a good court-house, mill, several mechanic shops, school-house, churches, and several nice private residences. Its traffic is local, but quite extensive for its size.

Newfoundland and *Bruin* are neat villages, with good local trade, each doing a large traffic in the smaller industries of the country.

Schools and Churches.—The districts all have schools taught under the public school system of the State, and are doing well. At Newfoundland, E. J. Friend has an excellent institution, at which the higher branches are taught to those desiring them. He has gained a high reputation as a teacher of youth, and his school discipline is sustained by the public sentiment of a very intelligent and well-educated community. The Methodist, Primitive and Free-will Baptist, and Reformed Christians, are the principal religious denominations in the county. The church buildings (except a few, which are very handsome) are generally plain houses, the good, pious people of Elliott feeling contented to worship in faith and in truth, although their houses may not be gaudy, or their preachers be high-salaried priests, giving sermons that cost the congregations above their ability to pay.

Smaller Industries.—The manufacturing business of this county is conducted almost entirely by the energetic, enterprising ladies of the

country, and consists chiefly of domestic goods, made on the old-fashioned hand-looms. Flax, cotton, and wool are raised for home consumption, and through the industry of the female population, the spinning-wheel and loom are kept busily at work throughout the year in converting these raw materials into jeans, linseys, kerseys, linens, counterpanes, comforts, quilts, towels, and all kinds of such goods as are used by families in their every-day wear. On big occasions, the "Sunday clothes" of "bought goods" come to the surface; but the people have not yet learned the extravagant notions, nor do the ladies sigh for the "duck of a hat" that causes so much rivalry and unhappiness to their sisters of the city districts. Eggs, butter cheese, poultry, feathers, beeswax, honey, maple sugar, molasses, wool, hides, tar, and dried fruit constitute articles of traffic at all the country stores and villages. The excellent motto, "pay as you go," is practiced by the honest yeomanry, and complaints of "hard times" are not known in the country. The people are kind, hospitable, and intelligent, and desire greatly to have immigration to come in and settle the vacant lands now lying waste.

ESTILL COUNTY.

This county, named in honor of James Estill, was formed in 1808, from parts of Madison and Clark, and is now bounded as follows: North by Clark and Powell, east by Powell and Lee, south by Jackson, and west by Madison county.

Topography and Geological Formation.—Estill county is located about centrally between the north and south limits of the State, and about equidistant from Louisville and the western border of Virginia, on each side of the Kentucky river, and just at the concentrated point of all the geological rock formations in the State. Consequently it contains almost every class of soil, rocks, and minerals to be found in Kentucky. Here we find in abundance coal, iron ores, some zinc, copper, and lead, the best of mineral and salt waters, and stone suitable for any purposes required. A lithographic stone-quarry, located on Kishner's creek, about four miles from the Kentucky river, is now being worked by

Messrs. Bruner & Adams, who supply stone to lithographers in Louisville, Cincinnati, and other places. The stone is of a cream color, and very fine texture, and makes excellent plates for maps, landscapes, or pictures. The coal measures are found in nearly half of the county. The upper Silurian, the Devonian shale, the Waverly, and the sub-carboniferous all outcrop along the creeks and hills in many localities. The eastern and southern portions of the county are very hilly, with spurs of the Allegheny Mountains running through them. The northern and western parts of the county are undulating, but not so rough. The coal and iron ores in the eastern and southeastern, and the iron in the northern part of the county, are equal, probably, to any in the State. The zinc, lead, and copper ores are found, but not in quantities sufficient to be profitably worked. The soil is as varied as the geological rocks; the bottom lands are very rich, while the hills and ridges vary from rich to very poor. Where the black shale of the Devonian crops out, the land is slushy, and cold or crawfishy, but this can be made into excellent meadows by tile-drainage. The coal and iron ores and timber ought to make this a very rich county when the Kentucky river has the dams repaired and built to the Three Forks, transportation to market being the only drawback to the profitable employment of capital in their development.

Timber.—The forests of Estill are magnificent. Every class of hard and soft wood is found here in great abundance, varying, in different localities, according to the geological formations. The most common trees are the various kinds of oaks, poplar, cherry, walnut, butternut, pine, spruce, gum, locust, birch, beech, hornbeam, maple, sugar-tree, alder, ash, holly, elm, hickory, black-jack, dogwood, ironwood, wahoo, cedar, box-elder, witch-hazel, &c., &c.

Streams and Water-power.—The Kentucky river passes through the centre of the county, and can be made navigable the year round by an extension of her lock and dam system, and can also afford ample water-power for a great number of mills and factories. Red river is an excellent stream for water-power, and can easily be made navigable by slack-water. Station Camp, Miller's, Red Lick Fork, Buck, Drowing, and Cow creeks, are all good milling streams, which have fall enough to supply a great deal of power for machinery.

TOWNS AND VILLAGES.

Irvine, the county seat, is beautifully located on the north bank of the Kentucky river, and contains about five hundred population. It has

a fine court-house, several factories and steam-mills, a few elegant churches, a well-built, commodious academy, large tanneries, and a dozen mechanic shops.

Fitchburg, Winston, Wiscmantown, and Red River Iron-works are all thriving villages, doing each a large local trade in dry goods and groceries, and considerable traffic in the smaller industries of the country.

Furnaces and Manufactories.—Over ten thousand tons of pig iron are annually made in this county. The Red River Iron works, the Forge, the Estill Steam Furnace, and the Cottage Furnace, all employ large capital in the manufacture of iron. Several extensive steam saw-mills and flouring-mills are located in different parts of the county. A woolen factory is operated at Irvine, and several wagon and wood-workman's establishments at different points, besides a large number of small mechanic shops, producing many things needed by the people of the country.

Mineral Springs and Petroleum.—Mineral springs of sulphur water, salt water, and chalybeate are quite numerous, and said to be of excellent quality. The "Estill Springs," near Irvine, are among the most celebrated as a fashionable watering-place in Kentucky. Several borings have been made for salt water, which have, at various depths, struck both salt water and petroleum or coal oil of a good quality. The black shale in this county is one hundred feet thick.

Crops and Fruits.—The bottom lands produce in abundance corn, wheat, rye, oats, flax, hemp, and tobacco. The thin sandy lands are particularly adapted to peanuts, and would, no doubt, produce more profitable crops of these than they would of corn, wheat, or tobacco. Flax also grows well on these lands; and since the invention of a brake that can clear the fibre of the stalks so very cheaply, it will become a leading staple in the county. Orchards are not so abundant as they should be on soil so peculiarly adapted to fruit culture; but the farmers are planting more fruit trees now than at any previous time. Apples, pears, peaches, plums, and cherries grow with remarkable vigor and upon the rolling lands yield bountifully every year. Grapes have not been tested as fully as is desired, but far enough to prove that vineyards will here find a congenial soil, well drained, and rich in the elements that make most luscious fruit and wine of excellent bouquet, upon the sunny slopes that rise from the margins of the streams.

Live Stock.—Estill is fast improving in the breeds of all kinds of stock and poultry. The neighboring "blue-grass" counties furnish her

with good bloods of horses, cattle, sheep, and swine; and the good sense of the farmers have taught them that these are the only kinds of stock that pay for the keeping. The old-fashioned "scrub stock," once the favorite, is gradually disappearing before the advancing wave, and before many more years, we trust, will disappear among the things of the past. It is hard, however, to get everybody to give up the "razor-back" hog, "that can make his own living;" but even he is declining in popularity.

Smaller Industries.—General contentment prevails among the farmers, and there seems but little disposition to change the old order of things; therefore, we hear throughout the valleys of Estill the constant music of the spinning-wheel, and the echo of the hand-loom, as in days of lang syne. The ladies are remarkable for their industry and economy, as well as their finely-developed physiques and well-formed, cheerful, rosy faces. They card, spin, and weave quantities of cottonades, jeans, linseys, kerseys, linens, counterpanes, and other home-made goods for family use and traffic; and in these the farmers dress, except when "Sunday clothes" are drawn out on special occasions. A large traffic is also carried on in beeswax, honey, eggs, butter, fowls, ginseng, feathers, and dried fruit.

Schools and Churches.—The county is well supplied with churches, there being one or more in almost every neighborhood. The leading denominations are the Methodist, Baptist, Reformer, and Presbyterian, with some Catholics, Episcopalians, and Universalists scattered through the country. The average distance which the people have to go to church will not exceed five miles. The public school system of the State has been inaugurated in the county, and a school is taught in nearly every district. An excellent academy is taught at Irvine, where the pupils can learn the higher branches of science and the languages.

Immigration.—Within the last few years many emigrants have settled in this county, whom the intelligent, hospitable people welcome with open hearts, and desire others to come and share with them their healthy climate and many natural resources yet undeveloped.

FAYETTE COUNTY.

Fayette county, named in honor of Gen. Lafayette, was formed in 1780, by the State of Virginia, and is one of the three counties into which the whole district of Kentucky was divided, the other two being Jefferson and Lincoln. It originally embraced all the territory lying north and east of the Kentucky river, and its principal branch. It has been cut down and lopped off until now its area is less than that of a majority of the counties of the State. It is now bounded on the north by Scott, east by Bourbon and Clark, south by Madison and Jessamine, and west by Woodford county.

Geology and Soil.—Fayette is based exclusively upon the upper Cambrian or lower Silurian rocks. The strata which come to the surface are mostly those containing the largest proportion of organic remains, interstratified with green marls, which form the very best soils in the State. These strata, being very thin and calcareous, easily disintegrate, and are therefore continually adding new rich dirt to the already fertile soil. The face of the country is generally level or gently rolling, presenting a most beautiful landscape picture to the eye. The analyses of numerous specimens of the clay and top dirt by the famous agricultural chemist, Dr. Robert Peter, of Lexington, the Chemical Director of the two Geological Surveys of Kentucky, show the soil of Fayette to average among the richest uplands of any country on the earth. Blue-grass, corn, and hemp here grow to perfection, and the live stock of every class ranks as the peer of any in the world. Such lands, of course, surrounded, as they are, by every convenience which the art of man can contrive, are valued at figures which seem high for a country but little over a century old. Prices ranging from \$60 to \$150 per acre are freely paid for good tracts, but even this is cheap, when we consider that these lands, when well set in blue-grass, with their never-wearing rock fences, rent at \$10 for the use of the grass alone for blooded horses, cattle, sheep, and swine, while first-class hemp lands even exceed these figures. There are no minerals in this county of sufficient importance to attract attention. There are some good mineral waters, and much good building rock, including the Kentucky river marble, which outcrops at several localities.

Agriculture.—The farms of Fayette are devoted generally to hemp culture and stock, for which they are particularly adapted on account of their great productiveness in hemp fibres, blue-grass, and Indian corn. It is not uncommon to see fields of corn yielding from sixty to eighty bushels to the acre, and blue grass superior to that found in any other country on the continent. The wheat and tobacco capacity of the soil is not so good as that of the South Kentucky barren lands, nor are the adaptability for fruits as great as that of the lands located on the Waverly and Devonian Groups, or upon the true coal measures in the mountain counties. Yet both wheat and tobacco, as well as all kinds of fruits, do well in this generous soil, and yield largely above the average in other counties. For healthfulness and productiveness combined, probably no county on earth excels Fayette and the regions adjacent.

Live Stock.—Here, by common consent, the imagination centres the Elysian fields for blooded horses, Short-horn cattle, Alderney milkers, Cottswold, Merino, and Southdown sheep, the best breeds of Poland-China, Chester White, Berkshire, and other fancy hogs, and the finest specimens of game and other choice breeds of chickens and other fowls. No part of this continent has made so much reputation as that portion of Kentucky of which Lexington is the centre in fine racers, swift trotters (splendid exploits of racking, pacing, and trotting horses), or in large work stock or mules, adapted by hardness of bone and muscle to endure the heaviest drafts on the roughest roads, either in the Northern or the Southern States. In first quality of beef cattle, the blue-grass stock of Kentucky and the famous English Durham and Short-horns of the British Isles take the lead over all other countries. In hog products, the Westphalia hams do not excel the sugar-cured of Central Kentucky, and in Southdown mutton, no part of Europe can excel what we find every day in the markets of Lexington and Louisville.

CITIES AND TOWNS.

Lexington, the county seat, is beautifully located, about the centre of the county, on a plateau of beautiful meadow land, which it seems is almost too pretty to be covered with houses. It contains over 20,000 inhabitants, and has been not inaptly called the "Athens of the West." Probably no place in America has more advantages, according to its size, than Lexington, when we consider healthfulness, beauty, rich surrounding country, wealth, manufacturing facilities, easy methods of

travel and transportation, good water, good society, educational colleges and academies, and plentiful supplies of all kinds of food, whether animal or vegetable. No city of the same size in any country can excel her in the combination of all that go to make up a good home or a fine business location. (See page 93.) The villages in the county are *Athens, Athens Station, South Elkhorn, Walnut Hill, Slickaway, Duncan, Chilesboro, Yarnalton, and Bryant.*

Schools and Colleges.—The Kentucky University, under the management of the Reformed Christian Church, is located at Lexington. It has its College of Arts, College of the Bible, College of Law and Medicine, and Agricultural and Mechanical College. This institution succeeded the Old Transylvania University, once the leading literary institution in the Western country. It has an able corps of professors and tutors, and a good system of studies, with a strict system of military drill, according to the tactics used at West Point. *Hocker Female College*, Robert Graham, President, assisted by nine instructors, has over one hundred students, and is located most beautifully at Lexington. It bestows on pupils completing a full course of studies a diploma and gold medal. *Lexington Female College*, an excellent institution, has about eighty students, and eight instructors. R. Ryland, D. D., is President. *Sayres Female College*, H. B. McClellan, A. M., President, with an able faculty of assistants, is one of the best female institutions in the country. Its grounds and buildings are very handsome, being located in the very heart of the city. There is also a regularly organized public school system in Lexington, besides several excellent private schools, in all over twenty. Throughout the county are also good public and private schools in every neighborhood.

Churches.—The Catholic, Episcopalian, Reformed Christian, Baptist, Presbyterian, Methodist, Lutheran, Unitarian, and Universalist, are the principal denominations of Christians. The church buildings are generally elegant specimens of architectural skill, and are numerous scattered over the city of Lexington and throughout the county.

The People.—No part of the State has furnished so many historical characters as Lexington and Fayette county. The people are remarkably intelligent, kind, industrious, thrifty, and hospitable. Their manners are open, free, and frank, and everything betokens a race of men and women not to be excelled by any portion of the human family in morality, virtue, high-toned manly honor, intellectual acquirements, or nobleness and true chivalry of character. Persons from other States or

countries, who wish to find everything desirable to make life happy, homes prosperous, or business successful, can find all these in this beautiful and attractive county.

FLEMING COUNTY.

This county, named in honor of Col. John Fleming, was taken from a part of Mason in 1798, and is bounded as follows: north by Mason and Lewis, east by Lewis and Rowan, south by Rowan and Bath, and west by Bath, Nicholas, and Robertson.

Geology and Soil.—The Geological formations of this county are quite variegated. On the west, the basis is Cambrian or lower Silurian limestone, on the east, upper Silurian and Devonian rocks, and in the extreme northeastern part, the Waverly series come to the surface; consequently, the surface of the country corresponds to these formations; the west half is rolling, and abounds in creeks and small hollows based on blue limestone, rich, and very productive of hemp, corn, blue-grass, and barley; the east and northeast is hilly or slightly mountainous, with poor ridges, and very fertile bottoms along the rivers and creeks, well adapted to the growth of corn, wheat, clover, tobacco, and fruit of all kinds, and abounding in mineral and salt springs of very fine water. The nearest approach to coal is the black Lingula shale along the eastern border of the county. The country immediately around Mount Carmel, Hillsboro, and Poplar Plains is based on the magnesian limestone, which passes under the knobby formation towards the east. The soils, derived from the upper beds of magnesian limestone, have a brownish-red cast, and produce beech, walnut, sugar-tree, white oak, ash, and hickory. The lands between these and the "knobs" is rather sobby, and wheat is apt to freeze out. This might be much improved by tile-drainage. There is a strip of flat white oak land adjacent to the magnesian limestone lands, derived from a kind of clayey shale, which is considered by many the poorest land in Fleming, but which could be made a very productive soil by a proper system of drainage, and the application of lime or land plaster and German kainit. There are prob-

ably no minerals in quantities to pay for working, although iron ores are to be found adjacent to the Devonian shale.

Streams and Water power.—The Licking river, which forms the southwestern boundary of the county, is a stream sufficiently large to be made navigable by slack-water for steamboats; as it is, flat-boats and rafts of timber in large quantities are annually floated out to the Cincinnati market. Fleming, Fox, Locust, and Limestone creeks afford good drainage and several excellent mill-sites, with good water-power.

Timber.—Fleming was originally one of the best timbered counties in the State, and about 40 per cent. of the land is still covered with the native forest growth, such as walnut, gum, hickory, ash, cherry tree, locust, all kinds of oak, maple, sycamore, beech, elm, birch, poplar, hornbeam, ironwood, buckeye, butternut, &c., &c. Immense quantities of sawed timber, staves, and logs are taken every year from this section down the Licking river.

Crops and Fruits.—Hemp, wheat, tobacco, corn, oats, rye, flax, and hay are the staple crops. Blue-grass grows well in nearly all parts of the county, and affords excellent pastures during the entire year, when not covered by snow. In some parts of the county hemp grows as well as it does in Fayette or Woodford. Fruits of all kinds flourish, and apples, peaches, pears, quinces, cherries, plums, &c., yield full crops nearly every year. The calcareous soils of the eastern and southern hill-sides and slopes are peculiarly well adapted for vineyards, and the native vines grow and produce fruit amazingly well. This industry should be extended, and wine from American vines, no doubt, would pay as well, if not better, than any other crop. (See Wine-making, Washington county.)

Cheese Factories and Mills.—Chas. Marshall and other enterprising gentlemen, before the war, tested cheese-making and the dairy business in Fleming, and found that the soil, climate, water, and grass were peculiarly well adapted to this industry, and that cheese and butter equal to any in the world could be made from the "blue-grass milk" of Kentucky. The co-operative dairy plan, now so fully under operation in Ohio, New York, and Pennsylvania, if introduced here, or in the other blue-grass counties of the State, would make the dairy business larger than all the combined farming industries of the land. The dairy products of the State of New York are over \$100,000,000 per year, and larger than that of all the hemp, tobacco, and flax products of the nation. (See Dairying.) There are numerous steam and water grist

and saw-mills, and several woolen factories in the county, all doing a good business.

Live Stock.—Some of the best bloods of horses, cattle, sheep, and hogs in the State are to be found in this county. The farmers have learned not to feed to inferior animals, when the same food pays double fed to the best breeds. In some neighborhoods the scrub stock still holds sway, but these are fast disappearing.

TOWNS AND VILLAGES.

Flemingsburg, the county seat, is situated six miles east of the Lexington and Maysville Railroad, in the northern half of the county. It has a population of about five hundred persons, and contains a fine court-house and other public offices, six or eight handsome churches, two academies, several mills, a bank, a dozen mechanic shops, good store-houses, and many elegant private residences. The narrow-gauge railway from Johnson's Junction, on the Lexington and Maysville Railroad, to Hazel Green, has been completed as far as Flemingsburg, and now makes daily trips,

Elizaville, five miles from Flemingsburg, on the Lexington and Maysville Railroad, is a flourishing town of over three hundred inhabitants. *Tilton*, six miles south of the county seat, is a thrifty town of about two hundred people. *Sherburne*, on Licking river, has about the same number of inhabitants, and does a large local trade. *Poplar Plains*, five miles southeast of Flemingsburg, is quite a pretty town, with a large local business and many handsome houses, and over three hundred inhabitants. *Hillsboro*, in the southeastern part of the county, is a beautiful town of over three hundred people, noted for its good health and pretty country. *Mt. Carmel*, in the northern part of the county, has a population of two hundred and fifty, and does a very extensive local trade. *Centreville*, *Farmville*, and *Ewing* are neat, thrifty villages.

Domestic Arts.—The good old fashion of making home-made jeans, linseys, cottonades, linens, and counterpanes still prevails to a considerable extent among the industrious, energetic ladies of Fleming, who, in this way, manage to furnish their families a large proportion of their daily wear. They also traffic these articles for groceries and "store goods" with the merchants, thus procuring the more fashionable articles needed by themselves and daughters. A considerable trade is done by the country people in eggs, butter, poultry, feathers, beeswax, home-knit socks, maple sugar, tree molasses, and ginseng root.

Schools.—Two excellent academies (male and female) are located at Flemingsburg, and several private schools in the other towns and villages. The State free school system has been inaugurated, and schools are taught in every district not less than five months in the year. The people seem anxious to have their children educated, and show a commendable zeal in keeping up the schools.

Churches.—The Iron-clad Baptist, the Reformer, the Methodist, the Presbyterian, Episcopalian, Universalist, and Catholic are the principal religious denominations. There are good, well-built, commodious church houses in every neighborhood, which are usually attended by large congregations.

Social Characteristics of the People.—Fleming county can boast of as intelligent, honest, and industrious a population as any in the Western country. Her people are kind, generous, neighborly, and hospitable, and are anxious to have emigrants from other States or Europe to come and live among them. They have no foolish aristocracy or religious or political fanaticism, but judge every one by his own habits of industry, sobriety, and honorable dealing, and rank him accordingly.

FLOYD COUNTY.

In 1799 Floyd was formed from parts of Fleming, Montgomery, and Mason counties, and named in honor of Col. John Floyd. Its territory has been repeatedly cut down, until now it is but a tithe of its former self. It is now bounded on the north by Johnson and Martin, east by Pike, south by Pike and Letcher, and west by Letcher, Magoffin, and small points of Perry and Breathitt counties.

Geology and Minerals.—The carboniferous formation underlies the entire country. The *uptilt* of the Appalachian chain of mountains has given to this portion of the State quite a rugged, bluff appearance. The hills are often over five hundred feet above the plains, and the cliffs are sometimes very grand. Coal and iron ores are found without limit in every section of the country, and in some places other metals, among them silver and copper, have been reported; but probably this was a

mistake, as the rocky formations do not justify the belief in their existence to any extent. Building stones, grindstones, mill-grit, whet-rocks, and gypsum exist in abundance, and will some day be of great value. The iron ores in this section of Kentucky are truly immense, and will, in the great future, bring much treasure to the Commonwealth. At this time, however, neither the coal, iron, timber, or stone can be properly utilized, for want of facilities of transportation; but when Beaver creek, West Fork of Sandy, Tug, and Louisa rivers are made navigable by slack-water, this hidden wealth will be made available, and the hills and mountains of Floyd and other counties in that part of the State will become of immense value.

Soil and Timber.—The river and creek bottoms are exceedingly fertile, and produce excellent corn, wheat, and tobacco. The north hill-sides are generally rich, while the ridges and south sides of the mountains are generally rocky and poor. The soil seems peculiarly adapted to vegetables and fruit. Cabbages, turnips, beans, and all kinds of esculent roots grow to perfection. The timber is yet in a state of nature, more than three fourths of the country being still in primitive forests; and, in many places, miles intervene between one small farm and another. The growth consists of all kinds of oaks, fir, pine, hemlock, arbor vitæ, holly, cherry, walnut, butternut, maple, locust, sugar-tree, hornbeam, wahoo, cucumber tree, black-jack, willow, hickory, chestnut, elm, red-bud, poplar, gum, sycamore, cottonwood, and various other kinds of trees indigenous to mountainous countries.

Rivers and Creeks.—The West Fork of Big Sandy river runs through the centre of the county, and affords fine water-power for manufactories, forges, and mills. The fall on this stream is such that small dams could be built, which would utilize immense water-power. Tug and Louisa are good-sized streams for mills and factories, and have many fine sites suitable for the use of excellent water-power. The branches of these streams are numerous, and well adapted for grist-mills. Slack-water navigation might be made upon West Fork, Tug, and Louisa to the great advantage of the eastern border counties of Kentucky, and give an outlet for the coal, iron, timber, and farm products, which are now land-locked among the hills and mountains. Mineral springs of excellent water abound in all this section of the State, many of them very similar to the far-famed White and Red Sulphur waters of Virginia.

Crops and Fruit.—Agriculture is in a primitive condition throughout the mountain counties, and but few of the products of the soil are sent to foreign markets. Corn, wheat, rye, oats, barley, flax, tobacco, and

hay grow well, and produce fine crops, but the want of a convenient market cuts off the stimulus of energetic industry beyond what is necessary to produce home supplies. Flax might be made immensely profitable if the new patent flax-brake could be introduced, which breaks and cleans over 1,000 pounds a day at a mere nominal cost. Fruit never fails in this county. Apples, peaches, pears, cherries, plums, berries, and nuts of all kinds, and every other class of fruits suited to this climate, grow to perfection and without fail every year. Vineyards of the best wine-making grapes would flourish here better than in the Alpine regions of France or Switzerland, or the Appenine hills of Spain. Bees do well in this county, and are enabled to gather the purest and best of honey from the native flowers, tree blossoms, and fruits.

TOWNS AND VILLAGES.

Prestonsburg is romantically located on West Fork of Big Sandy, near the centre of the county, and contains about two hundred persons. It has a good court-house and other public buildings, several mechanic shops, good mill, a fine school house, and several nice private residences.

Hucysville, *Lanesville*, and *Martinsdale* are handsomely located villages, each of which does a large local traffic.

Schools and Churches.—The free public school system of the State is in operation in nearly every district of the county, and great improvement is reported in the grade and qualifications of teachers. The children seem to improve rapidly, and parents are more inclined to patronize schools than formerly. The Primitive or "Hard-shell" Baptist, the Missionary Baptist, and Methodist are the chief denominations in the county. The Reformed Christians are becoming more numerous, and some few Presbyterians are in the county. The style of church architecture is rather primitive in some neighborhoods; although there are some fine churches, yet the majority are of the old-fashioned log kind, where pure Christian morality can be taught without the glare of fashionable cupolas or cushioned seats. The people are kind, intelligent, and moral, as much so as anywhere else.

The Smaller Industries.—The excellent ladies of Floyd are noted for the manufacture of good home-made cloth of cotton, wool, and flax. They have not yet thrown aside the flax-wheel, the cotton-cards, or the hand-loom, but every family vies with its neighbor in making the best jeans, linseys, flax and tow-linen cloth, counterpanes, comforts, quilts, socks, and other domestic goods for family use or traffic. Eggs, poul-

try, beeswax, honey, maple sugar, molasses, dried fruit, ginseng, shuck and bark collars, and home-made leather and shoes, are produced in quantities sufficient for home consumption and local traffic. There are but few factories outside of those at home, but every family knows how to provide most of the articles, such as plows, wagons, &c., needed for local use.

FRANKLIN COUNTY.

This county was taken from parts of Woodford, Shelby, and Mercer, in 1794, and named in honor of the great sage, Dr. Benjamin Franklin. It is bounded on the north by Henry and Owen, east by Scott and Woodford, south by Woodford and Anderson, and west by Shelby and Henry counties.

Geological Features.—Franklin county is based exclusively upon the lower Silurian formation of rocks, which has a great diversity of strata coming to the surface. There are no minerals in this formation in quantities sufficient to be valuable in working. Some lead ores and specimens of iron (shot ores) are frequently to be met with in Franklin and the adjacent counties; in fact, those strata adjacent to the “birds-eye limestone,” or Kentucky river marble, frequently have specks and small nodules of galena or sulphurets of lead scattered sparsely through them, which are evidently not from true veins, but of aqueous origin, and such as segregated and settled in their present position when these rocks were formed at the bottom of the ancient sea, which then covered all this portion of the planet. On Elkhorn, Flat creek, and Benson, these ores of lead are quite common.

In several places, in wells sunk to the depth of from 200 to 300 feet in the river or creek bottoms, large quantities of inflammable gas has been struck, usually attended with strong mineral and magnesian water. At one place, Stedman’s mills, on Main Elkhorn creek, this gas was used during some time for illuminating purposes. One of the strongest jets of this illuminating gas yet noticed issued from a well sunk near the railroad depot, in the city of Frankfort, which, after burning for

many hours, was plugged up, and the well filled in for fear of some serious accident. There are several strata of good building stone in this county, notably among which is the Kentucky marble, or birds eye limestone, found in inexhaustible quantities along the banks of the Kentucky river, as well as along the bluffs of the smaller creeks. Interstratified with the thin layers of calcareous limestones are found numerous thin layers of marl, some of which are very rich (particularly that of a green color) in phosphates, but, unfortunately, the strata of marls are too thin, and the superincumbent rocks too thick, for profitable working.

The surface of the country, next to the counties of Owen, Scott, Fayette, and Woodford, is either level or gently undulating, with high bluffs on the creeks; much of the balance of the county is noted for its high hills and ridges, upon which, however, is nearly always a very productive soil, except in spots where the land appears to be too sour, and the top soil too thin, with a clay inclined to be of a yellowish cast. Some of the finest specimens of blue limestone rocks, composed almost exclusively of fossil shells and corals, rich in plant food, are to be found in different parts of this county. The river and creek bluffs, frequently from two hundred and fifty to three hundred feet high, form most picturesque scenery, equal in many respects to that of the Rhine or the Hudson. Mineral waters are quite common, both from natural springs and artificial wells. The mineral well bored by Col. Reynolds, one and a half miles from Frankfort, is nearly identical in chemical elements, and probably as good for medical purposes, as the celebrated Blue Lick water of Nicholas county, both of which evidently are derived from the same great water reservoir—the calciferous sandstone of the Cambrian formation—and partake alike of the mineral elements and fossiliferous infiltrations deposited ages ago at the bottom of an ocean, which was drained of its waters before or when the mountains were elevated.

Agriculture.—Much good hemp and blue-grass land is to be found in Franklin, wherever the fossiliferous blue limestone comes to the general surface. Corn grown here is also exceedingly heavy, and contains that peculiar quality so essential in good Bourbon whisky. This corn will make five per cent. more whisky than the corn grown on any other class of soils. The same may be said of the barley and rye; consequently, we find the “Lager-beer brewed in Frankfort,” out of native malt, the richest and best to be found in the Western country. As a wheat county, Franklin ranks well, but not so good as Christian, Todd, Barren, Warren, Logan, and other counties lying on the cavernous grey limestone formation.

For stock of all sorts, however, Franklin far excels these counties, and all others not located on the true blue-grass on Silurian rocks. The horses, mules, cattle, hogs, sheep, and poultry are of the best pedigrees in the United States, and are noted for their great excellence of beauty, bone, and muscular powers. From this county are exported many of the best and swiftest racing and trotting horses, the largest, toughest, and best mules, the best milk cows and beef steers, the finest long-wool sheep and Southdown muttons, and the largest Berkshire, Chester-White, and Poland-China hogs to be found in the United States. In fruit of all kinds this county also excels, particularly in apples, pears, and cherries. Vineyards do well when planted in Concord and other native wines, and much of the wine made (in a small way) is very superior in saccharine matter, grapiness of flavor, and general bouquet. The finest pears I have seen produced in Kentucky this season came from the orchard of Mr. G. W. Crutcher, an excellent farmer, who resides a few miles from Frankfort on the Versailles pike. Vegetables of all kinds grow to perfection, and the market gardeners find no trouble in producing everything usually grown in this climate, equal to the best similar articles generally found in either the Louisville or Cincinnati markets. The milk and butter of Franklin county are not excelled in any part of the world. The strangest thing to a person, who sees the fine cows, and drinks of the rich creamy milk, and eats of the delicious golden butter of Franklin, is why there are no great co-operative dairy associations here, as there are in New York, Ohio, or England, neither of which excels, if they equal, Franklin county in the excellence of these essential articles of food. (See article on Dairying.) Poultry and bee culture could be carried on here with as much profit as anywhere else in the State, and might be made exceedingly lucrative, with the use of a very small capital invested.

TOWNS AND VILLAGES.

Frankfort, the county seat, and Capital of the State (see article Cities and Towns), is beautifully located upon each side of the Kentucky river, sixty-six miles from its mouth, and sixty-five miles, by the Louisville and Lexington Railroad, from Louisville. It has a population of about seven thousand, noted for their intelligence, refinement, education, wealth, and hospitality. The State House and public State offices are handsomely situated upon the central square of the city, on the north side of the river, and consist of the State House (wherein the

Legislature meets every second year, and the Court of Appeals during ten months in each year), the Governor's Office, the Auditor's Office, the Land Office, the Office of Superintendent of Common Schools, the Office of the Bureau of Agriculture, Horticulture, and Statistics, the Offices of the Adjutant General and Quarter-master General of the State, the Offices of the Geological Survey and the Insurance Bureau, the Public State Library, and the Office of the Clerk of the Court of Appeals.

Frankfort has a good court house, and other public county and city offices, a theatre, elegant Masonic and Odd Fellows' Halls, several large hotels, numerous tasteful private residences, many fine churches, a Penitentiary, containing about one thousand State convicts, an Institute for the Feeble-minded Children of the State, a beautiful cemetery, in which have been buried, at the State's expense, many of the most distinguished settlers, statesmen, and soldiers of Kentucky, over whom a most elegant and suitable military monument, and other monuments, have been erected. Frankfort also has a large cotton factory, and several large distilleries, besides other factories, saw and grist-mills, planing-mills, &c., &c., and numerous mechanic shops. Her schools are unsurpassed by those of any city in the Union of her size. These consist of the mixed high school, "Eclectic Institute," under the able management of Prof. J. W. Dodd, assisted by an able corps of tutors; the Dudley Institute, under the charge of Prof. Turner; the Greenwood Academy, taught by an able lady teacher, Mrs. Runyan, and her assistants, and the Public High Schools and common schools of the city, under the management of Prof. S. P. Browder, a gentleman of signal ability as a teacher and writer. There are also one or two good colored schools in the city. The Louisville and Lexington Railway, which passes through the city, gives easy communication every few hours with Louisville, Lexington, Cincinnati, and other cities, both North and South.

Bridgeport, Benson, Forks of Elkhorn, and Jones, are all neat, thriving villages, each doing the business needful in its neighborhood.

Education and Churches.—In addition to the schools mentioned above are several good private institutions in the county, and the common schools taught in every district under the State system. The *Kentucky Military Institute*, at Farmdale, having buildings valued at \$100,000, an excellent library and chemical apparatus, is under the superintendence of Col. R. D. Allen, and an able corps of professors and tutors. This institution has a fine reputation for thorough instruction, and a high

grade of scholarship. The curriculum of studies embrace the ancient and modern languages, and all the sciences usually taught at other colleges. Military drill is given after the manner of the instruction at West Point, the cadets always appearing in a neat gray uniform. The Governor of the State is *ex officio* president of the board of visitors. The number of students is about one hundred. The discipline is thoroughly military. The churches in Franklin county are generally very fine specimens of architectural excellence, particularly those of Frankfort. In every neighborhood outside of the city are one or more of these buildings, in which worship large congregations. Nearly every sect of Christians are represented among the different denominations, all of whom live in harmony, without any excess of bitter sectarian jealousy, which unfortunately sometimes exists in large communities.

Social Features.—Owing to the fact that the society of this county is continually receiving accretions from the best and most active political men of the State, we find here a peculiarly intelligent and highly refined community, such as is seldom met with in any section of country not similarly situated. The influence arising from this intermixture of the political elements is plainly visible throughout all the ramifications of society; so much so, indeed, that even the women and children are usually well posted upon subjects of social and political importance, either to Kentucky or the nation, and large expanded views are common to all classes. A peculiarly generous hospitality and ease of manners, betoken of superior talent, is to be met in every grade of society, which shows conclusively the truth of the old adage, that “circumstances give the development to every people.” •

FULTON COUNTY.

Fulton, the extreme southwestern county of the State, was formed out of a part of Hickman county in the year 1845, and named in honor of the first steamboat builder, Robert Fulton, and is bounded as follows: west and northwest by the Mississippi river, which separates it

from the State of Missouri, north and east by Hickman county, and south by the counties of Obion and Lake of the State of Tennessee.

Geology and Soil.—The quaternary formation distinguishes all parts of this county. No rock is to be found, except the conglomerate iron and sandstone, such as appears at the iron banks in Ballard county. The soil is in many places very rich, and in others rather sandy. The top mould is frequently from one to three feet thick, composed of vegetable matter thoroughly disintegrated. The earthquakes that occurred in 1811 have altered the face of the country in some places. At that time Reelfoot lake and Obion lake were formed, the two combined extending into Kentucky and Tennessee, nearly fifty miles long by one to three miles in width. In places the lands are rolling and in others quite level. The soil is well adapted to the growth of cotton, tobacco, corn, hemp, flax, wheat, oats, &c., &c.

Timber.—No country can boast of finer timber than is found throughout this county. The black oak, overcup, white, red, and water oak, cypress, ash, hickory, pecan, sycamore, cottonwood, mulberry, sassafras, gum, walnut, wild cherry, poplar, butternut, buckeye, and many other varieties of hard and soft timber trees, abound, and grow to immense size. A large trade in boards and staves, which are shipped to France *via* New Orleans, has been for many years carried on in this county. Quantities of the finest lumber are sawed by the steam mills, and shipped to Memphis, Vicksburg, New Orleans, and St. Louis. The pecan trees have been extensively used for axe-handles and carriage spokes, which are sent in the rough to the Eastern factories.

TOWNS AND VILLAGES.

Hickman, the county seat, is pleasantly located on the east bank of the Mississippi river, and contains a population of about 1,500 persons. It has an excellent court-house, several fine churches, a large academy, four or five hotels, steam manufactories of furniture, carriages, wagons, agricultural implements, flour, and lumber, besides over a dozen mechanic shops.

Cayce's Station, *Fulton Station*, and *Jordan Station* are each neat, thriving villages, doing a large local trade, and are shipping points for cotton, tobacco, wheat, corn, and all sorts of agricultural and lumber products.

Commerce and Manufactures.—The native growth of timber causes many persons to be engaged in the lumber trade, and steam saw and grist-mills produce flour, meal, and lumber in large quantities, which are

shipped to all points on the Mississippi river, as well as to the Southern States, by the river and railroads. Comparatively a small amount of the natural products or raw material is manufactured fully at the home factories, but only prepared in the rough for finishing. The commerce of Hickman, by way of the river and railroad, is larger in proportion to population than almost any city in the West. Much cotton and tobacco from the western part of Tennessee is shipped from this point, and the importations of a large section of both States come through this port. It is no doubt destined to be a place of importance in the future, owing to its peculiar locality as the last good high site on the Mississippi river for more than one hundred miles.

Crops and Stock.—Cotton and tobacco are extensively cultivated, and wheat grown very generally by the farmers. The rich alluvial soil is well adapted to all kinds of cereals and grasses, except blue-grass. Timothy, orchard-grass, clover, redtop, and millet flourish well, and frequently over three tons to the acre have been harvested of excellent hay. Corn grows to perfection, and hogs thrive here equal to any place in Kentucky. The breeds of horses, mules, cattle, and sheep have not received the attention that has been bestowed in many other counties, yet the native breeds are of the best quality of "scrub stock." Some public-spirited farmers are introducing better bloods, which soon improve the pedigrees wonderfully. The lighter sandy soils are well adapted to "goober peas" or peanuts, which are cultivated to some extent, and yield large profitable crops.

Streams.—There are, besides the Mississippi river, no large streams, and not many good mill-sites or water-powers available for machinery. The principal creeks are Dixon, Mud, Rush, Reelfoot, Bayou du Chien, and Little Obion.

Education.—The people are generally very intelligent and well informed upon all subjects, and are taking more pride in having the children of the county educated. The public school system of the State has been inaugurated in the county, and schools are taught in every district. A large academy, under the control of able professors, is located at Hickman, and others at Fulton and Jordan's Stations. A good Catholic school is also taught in Hickman, and several private schools, in which the higher scientific branches and the languages are taught, are scattered through the county.

Religious.—The Baptist, Reformer, Methodist, Catholic, and Presbyterian are the principal denominations of Christians, although there

are many Episcopalians, Unitarians, and Universalists scattered among the population. The church buildings in the towns and villages are excellent, but those in the rural districts are more unpretending in their architectural style, frequently consisting of the primitive log body, with clapboard roofs. Yet the honest, devoted, and faithful disciple here worships with as much hope as do the city soft-seated Christians in their elegant chapels.

Fairs and Agricultural Societies.—The Fulton County Fair Association has held several meetings, which were largely attended, and has done much towards improving the agriculture and stock of the county. The granges are in every neighborhood, and have been of great benefit in giving light, co-operation, and information to the farmers.

Domestic Economy.—The ladies of the county still manufacture, on the wheel and hand-loom, large quantities of jeans, linseys, linen, cottonades, counterpanes, blankets, and other goods for home wear and traffic. Eggs, butter, poultry, dried fruit, socks, honey, beeswax, tallow, candles, and feathers are produced in large quantities for home consumption and export; with these the family expenses are defrayed, and sometimes a good surplus left to be added to the accumulated wealth.

GALLATIN COUNTY.

Gallatin county, named in honor of Albert Gallatin, was formed in 1798, from parts of Franklin and Shelby, and is bounded on the north-west by the Ohio river, which separates it from Switzerland county, Indiana, north by Boone, east by Grant and Owen, south by Owen and Carroll, and southwest by Carroll.

Soil, Topography, and Geology.—The location of this county, on the Ohio river, between Louisville and Cincinnati, and the proximity of the Short-line Railroad between these cities to every neighborhood of the county, naturally give it all the advantages of suburban garden lands. The soil is well adapted to garden farming, orchards, and dairy productions, and the hills formed by nature for the most productive of vineyards. The geological formation is the lower Silurian, but owing

to the hilly surface various strata are brought to the top, and consequently give a variety of soils. The silicious mudstone, so prevalent in Boone and Owen, is also found in this county, and impresses its peculiar formation of soil. The calcareous marls and blue limestone disintegrations make soil very rich in plant food; even the subsoil abounds in potash, phosphoric and sulphuric acid, lime, magnesia, and the oxide of iron, and other elements needed by hemp, corn, wheat, tobacco, &c., &c. Where the silicious mudstone prevails the land is in some places "sobby beech" in the bottoms, while the hills, from better drainage, are well adapted to nearly every staple crop of the country. The oak lands are best for tobacco, while the flat beech lands can be turned, by tile-drainage, into excellent meadows. Blue-grass grows throughout the county, and adds much to the profits of the milk, butter, and dairy business of the farmers. There are no minerals or coal in the county, unless some, perhaps, small specimens of lead ore, such as are found in Franklin or Woodford counties. The easy disintegration of some strata, when exposed to the carbonic acid of the atmosphere, and the compact formation of others, cause the hilly appearance of the surface, and the deep ravines of the creeks.

Rivers, Creeks, and Railroad.—The Ohio river on the northwest, and Eagle creek on the southeast, give good drainage to the entire county, except the "sobby beech" lands, which are of small extent. The Ohio is navigable at all seasons of the year, and the Louisville and Cincinnati Short-line Railroad, which passes through the county, gives easy and quick transportation, both north and south, at all hours of the day. No country could be better supplied with traveling facilities and transportation than this county. The small creeks answer for mill purposes and stock water.

Stock and Stock-raising.—The fine blue-grass, timothy, and orchard-grass, and clover meadows pass this county naturally into stock raising, and every farmer is employed in this and garden farming or tobacco raising. Much attention is given to blooded horses, cattle, sheep, and hogs of late years, until now the old "scrub stock" has nearly disappeared, and their places supplied with better breeds. The Short-horns and Alderneys are the favorite cattle, while the red and black Berkshires, Poland-China, and Essex take the lead among the swine. The Cottswold and Leicester and Southdown are the favorite sheep. Poultry and eggs are becoming objects of considerable trade; the favorite breeds being the Brahmas, game, and dominique chickens, the Poland

ducks, the black and yellow turkeys, speckled guineas, and the old-fashioned goose.

Mills and Factories.—The only factories of importance are wagon and carriage-shops, blacksmith-shops, wood-workmen's shops, grist-mills, distilleries, saw-mills, and the various classes of mechanic shops. There are, however, enough of these to supply the home wants of the people, and something of every kind of their products for sale to the outside world. Timber is very plenty and of excellent quality, as are also other raw materials grown on farms; but the people have not as yet turned their attention much to the manufacturing industries.

TOWNS AND VILLAGES.

Warsaw, the county seat, is beautifully located on the Ohio river, 75 miles above Louisville, and is a place of large trade in tobacco, dry goods, and groceries. It contains a handsome court-house and other public buildings, one or two distilleries, grist and saw-mills, five or six fine churches, a good academy, a dozen or more mechanic shops, and many elegant private residences. The population of about 800 persons is cultivated, hospitable, and refined, and are desirous of having the advantages of their thriving town enjoyed by emigrants from other States and countries, whom they would welcome with true Kentucky hospitality.

Napoleon, a handsome village of 150 persons, is located seven miles east of Warsaw, near the railroad.

Sparta, *Glencoe*, and *Liberty*, all flourishing villages, containing each about 150 people, are situated on the Louisville and Cincinnati Short-line Railroad. They each have a large local trade, and are places of great traffic with the market men of the neighboring cities of Covington and Cincinnati.

Religious.—The Catholics, Methodists, Baptists, Reformers, and Presbyterians all have elegant churches in the different towns and villages, and elsewhere throughout the county. There are also several denominational schools taught by able scholars.

Schools and Seminaries.—The public school system of the State has been generally extended over this county, and schools are taught five months in the year in nearly every district. Male and female seminaries or academies are taught by able professors in every town and village, so that any person desiring to study the higher branches of literature or languages can do so at small cost. Few counties are better provided with schools than Gallatin county.

Smaller Industries.—The citizens of Gallatin have great market facilities, from their position on the railroad and the Ohio river. The lands are naturally productive and suited to the culture of fruit, grass, vineyards, and vegetables. Hucksters from the cities of Covington, Newport, Cincinnati, and Louisville are always ready to take all the garden, dairy, orchard, and vineyard products from the nearest depots, so that every farmer has a home market within a few miles. The people, in order to meet this state of things, have quit large plantations, and now employ all their labor on tobacco, stock, poultry, and garden farming products, dairies, and fruits. Immense quantities of butter, eggs, fowls, vegetables, milk, honey, large fruits, and berries are sold every year. Very little home manufactured cloths are made, the people feeling that it is cheaper for them to traffic the productions for Eastern-made goods than to manufacture even their every-day wear. Grapes and wine are getting to be quite common articles of home growth, but as yet little or no brandy is made either from the wine or the lees.

Timber and Springs.—What Gallatin lacks in coal she makes up in timber. Although one of the smallest counties in the State, she has some of the finest groves of all kinds of hard and soft wood, consisting of ash, walnut, hickory, sycamore, beech, birch, elm, butternut, maple, oak, cherry, locust, &c. Several fine mineral springs are in the county, similar to the waters of the "Blue Lick Springs." In fact, mineral water, by sinking a well or boring through the Silurian into the underlying calciferous sandstone, might be found almost anywhere in the county.

GARRARD COUNTY.

In 1796 this county was formed from parts of Madison, Lincoln, and Mercer, and named in honor of James Garrard. It is bounded on the north by Jessamine and Madison, on the east by Madison and Rockcastle, on the south by Rockcastle and Lincoln, and on the west by Lincoln, Boyle, and Mercer county.

Soils, Topography, and Geology.—The face of the country is generally hilly or rolling, with precipitous bluffs on the Kentucky river and creeks. Garrard county is about the middle of the State, if we leave off the narrow belt lying west of the Tennessee river. The soil is remarkably fertile, and produces hemp, flax, corn, wheat, oats, rye, barley, and tobacco, and all kinds of fruits, hay and grasses (for grazing purposes the celebrated Kentucky blue grass) in abundance. The entire county is located upon the upper Cambrian or lower Silurian formation, from the disintegration of which comes the rich marly, calcareous soils, so productive of hemp and blue-grass. There are traces of lead ore along the Kentucky river marble formation, and some "shot iron ores," but probably not enough of either to make it profitable to work them. The rocks were deposited entirely too early for coal, or even for the shale, but still there are some mineral waters of good quality to be found in the county.

Water courses.—The Kentucky river runs along the entire northern boundary, and the Paint Lick and Dick's creeks along the eastern and western borders. These, with their tributaries, give excellent drainage, and afford many good sites, with ample water fall for mills and factories. Buck, Henderson, Sugar, and Scott creeks are the chief small streams.

TOWNS AND VILLAGES.

Lancaster, the county seat, is located in the southern part of the county, on the Richmond Branch of the Louisville and Nashville Railroad, 112½ miles from Louisville. It contains a good court-house and other public offices, four elegant churches, a dozen mechanic shops, fine mills, prosperous academies and schools, and many handsome residences. Its population is about 1,000, and its business quite large, especially in dry goods, groceries, and live stock trading.

Bryantsville, Fitchport, Tetersville, Hyattsville, Paint Lick, Leavells, Lowell, Gilbert, and Buckeye are all neat, thriving villages, each doing a good local trade.

Schools.—*Franklin Institute* at Lancaster was chartered in 1847. Prof. G. W. Dunlap, with six associates, constitute the faculty of teachers. This institution is of a high grade, and well patronized by the citizens of Garrard and the adjacent counties; there are usually about 100 students. *Lancaster Male Academy*, at the same place, is a flourishing institution, under the charge of Prof. B. F. Hudson. It usually has from sixty to seventy five students. There are several other high schools and private academies in the county; besides which, free schools, on the State common school plan, are taught in every district. The people are

showing a commendable zeal in having their children well provided with schools, in which every minor can receive a good education.

Churches.—The Baptist, Reformer, Presbyterian, Methodist, and Catholic are the principal denominations of Christians in the county, although there are many Episcopalians, Unitarians, and Universalists scattered around. The church buildings are large, commodious, and built in good taste, and the congregations in every neighborhood are large, and habitually attend church well on the Sabbath.

Crops and Fruits—Hemp, flax, corn, wheat, oats, rye, and tobacco are the chief staples, while orchard-grass red-top, timothy, clover, Hungarian, and millet are cultivated for hay, and blue-grass grows luxuriantly for pastures. Most of the crops raised are consumed in the county, and fed to stock, which is sold on the hoof. Fruit of all kinds, particularly apples, peaches, pears, quinces, plums, cherries, &c., do well, and on the hills rarely fail of a bountiful crop. Grapes, so far as vineyards have been tried, grow finely, and the native varieties, such as Concord, Ives Seedling, Catawba, Hartford, Delaware, &c., mature well and make large yields of excellent berries, and wine of fine body and good bouquet. This industry might be greatly extended on the limestone hill and eastern and southern slopes, where there is good drainage, or where the drainage could be made perfect through earthen tiles. The soil of Garrard, when exhausted, can be greatly improved for all kinds of crops by the use of land plaster, German kainit, ashes, bone-dust or superphosphates.

Live Stock.—This is decidedly a "stock county," where "horse talk," "cattle talk," and "hog talk" are fashionable subjects in every congregation. Here are found some of the best pedigrees of horses, cattle, sheep, and hogs in the State, and scrub stock has long since given up the contest, and retired from the county. Bee culture and poultry are well attended to, and there are the greatest abundance of chickens, ducks, turkeys, peafowls, guineas, and honey for home use, and some for export. Still there are no "henneries" or "apiaries" as separate industries, which no doubt would pay as largely as any other kind of "live stock."

Domestic Arts.—The people of Garrard have long since become so rich and proud that they have, in a great measure, banished those good old relics of a former civilization, viz: the cotton-cards, the spinning-wheel, and the hand-loom; but still in some neighborhoods the hum and noise of these instruments are occasionally heard, under the guidance of the industrious, energetic female branches of the family, who

still make jeans, cottonades, linens, blankets, and linseys for home use and traffic. They also supply the merchants with home-knit socks, honey, beeswax, eggs, butter, feathers, poultry, ginseng, maple sugar, and tree molasses in exchange for "store goods" and fashionable ladies' wear. There are several large flourishing grist, flouring, and saw mills and woolen factories, but not such an amount of investments in factory business as there should be.

Social Features.—The people of Garrard are social, intelligent, industrious, and frugal, and well disposed towards all immigrants who may settle among them. They are remarkably hospitable and neighborly, and their rich soil and fine stock provides them the means to live upon "the fat of the land" at home. Immigrants will find this a splendid county in which to settle and do well.

GRANT COUNTY.

This county, named for two brothers John and Samuel Grant, was formed in 1820 out of a part of Pendleton county, and is bounded as follows: north by Boone and Kenton, east by Pendleton and Harrison, south by Harrison and Owen, and west by Owen and Gallatin counties.

Geographical Features.—Dry ridge, running north and south, divides the county into two parts. From this ridge starts several small creeks. Those on the west, Clark's, Arnold's, and Ten-mile creek, flow into Eagle creek, which turns a southwest course, after running a northwest direction through Scott, Owen, and Grant counties, and empties itself into the Kentucky river. Those on the east of the ridge, Crook, Fork Lick, the Grassy creeks, empty into Licking river. This ridge does not make and country hilly and rough, but quite undulating.

Geology.—The lower Silurian rocks underlie the entire county, but the silicious mudstone, which outcrops in Owen and Boone counties, also comes to the surface in Grant, and makes some "sobby beech lands." This soil is mostly south of Williamstown. The northern half of the county lies mostly on the blue limestone strata of this era, and is much richer in plant food. Owing to the close proximity of the under-

lying calciferous sandstones, there are numerous mineral springs, containing salt, magnesia, sulphur, &c., similar to the Blue Lick waters, that evidently take their origin from the same source. There are no coal or other minerals in this section, unless some inferior small deposits of shot iron ores and lead exist, not in quantities sufficient for working. The entire county will produce good blue-grass, and the "sobby beech lands," by proper tile drainage, can be made into first class meadows.

Crops, Orchards, and Vineyards.—Corn, wheat, oats, hay, hemp, flax, and tobacco all grow well, and are remunerative crops; but the contiguity of Covington and Cincinnati, and the facility of reaching these markets by the Cincinnati Southern Railroad, just built, will necessarily break up the planting system, and convert the population into garden and fruit farmers. Fortunately, the lands are peculiarly well adapted for this purpose, as well as for stock-raising and the dairy business. Vineyards of the native American grapes will bear splendid crops upon the east and south sides of the undulating rolling ridges, and prove the most lucrative branch of farming, as orchards and vineyards interfere very little with the other garden and dairy occupations. Excellent nut-ton, of noted flavor, comes from the hills and rolling lands of Grant county, none better on the continent. Peaches, apples, plums, cherries, and all the lesser fruits, and berries, thrive exceedingly well in every neighborhood, and will hereafter be sources of great profit to land-owners. Vegetables of all kinds flourish, and can be produced as certainly and as cheaply here as in any other country on the globe. Potatoes do particularly well, as do cabbage, cauliflowers, beets, turnips, and all other esculent roots. Every depot is a market, where city hucksters are always ready to traffic for all the products of the farm, garden, orchard, vineyard, hennery, or dairy.

TOWNS AND VILLAGES.

Williamstown, the county seat, has a population of about four hundred persons. It contains the usual county public buildings, several good hotels, five or six fine churches, a dozen mechanic shops, and many handsome private residences.

Crittenden, about the same size, is eleven miles nearer Cincinnati, and is a place of large local trade, and many handsome public and private buildings, and mechanic shops.

Downingsville, *Dry Ridge*, *Cordova*, *Corinth*, *Elliston*, *Stewartsville*, *Clark's Mill*, *Ganges*, and *New Eagle Mills*, are all neat, thriving villages,

with good local trade; all feeders to the daily markets of Covington, Newport, and Cincinnati.

Religious Denominations.—The Catholics, Baptists, Presbyterians, Methodists, and Reformers, each have fine churches and good-sized congregations in different parts of the county, and at the different towns. Some of the churches are elegant, all comfortable and roomy. Several eleemosynary institutions are active in the county, and a good state of morality exists in every neighborhood.

Schools.—The free public school system of the State has been inaugurated in every district, and schools are generally taught on this plan not less than five months in the year. There are many new-built handsome school-houses in the county, and some others of a more primitive style of architecture and antique system of conveniences; these will, however, be improved in a few years. An excellent classical and mathematical seminary is located at Williamstown, under the control of Prof. L. V. Ware and an able corps of assistants, whereat all the higher branches of science and literature are taught to the children of those desiring them to have a thorough education.

Live Stock.—Much attention is paid to breeding stock and poultry, and some of the very best pedigrees in the country are found on the blue-grass farms of this county. The Southdown mutton which Grant county sends to the Cincinnati market, as well as the butter and fowls, are noted for their excellence. Fine trotting horses, and excellent milkers and beef cattle, are found among those farmers who pay particular attention to stock.

Smaller Industries.—Owing to the traffic system, and garden and dairy farming, very little home-made cloth is manufactured, the people finding it cheaper to buy clothing and sell vegetables, milk, butter, eggs, cheese, chickens, ducks, turkeys, guineas, and fruits, than to card, spin, and weave by hand. Yet everybody keeps busy, the women in attending to the garden, dairy, and poultry departments, while the men cultivate the farms, orchards, vineyards, and attend to the stock. Thrift and economy are seen everywhere, and the citizens are fast becoming wealthy.

The Future Prospects.—Grant county in the near future will become subdivided into smaller farms; the tide of immigration that will tend southwards for the coming decades of years will first strike those counties adjacent to the larger cities, and fill them to a certain extent as it rolls onward, and will leave in its course much of the best material,

just as the heavy sands settle nearest the rim of the overflow. In this Grant county, as well as its neighbors, will become the centre of a most energetic, intelligent, and populous community, not excelled by any portion of the West.

GRAVES COUNTY.

This county was formed in 1823 from a part of Hickman county, and named in honor of Maj. Benjamin Graves. It is bounded on the north by McCracken, east by Calloway and Marshall, south by the Tennessee State line, separating it from Weakly county, in that State, and west by Ballard and Hickman counties.

Topography, Soil, and Geology.—Graves is the best shaped county in Kentucky, being the only one that forms a perfect square or parallelogram, and whose opposite sides are equal in length, and run due north, south, east, and west. It is also in the centre of "Jackson's Purchase," in Southwestern Kentucky, and presents on its surface every peculiarity of that section of the State. Geologically, the upper tertiary and quaternary formations alone are found within the county. There are no rocks, no cliffs or bluffs, sandstone or limestone, and no boulders anywhere to bother the farmer in the cultivation of his crops. Of course there are no minerals that can be profitably mined, or coal for furnace or grate use. There are large beds of lignite, which, by the ignorant, have been mistaken for true coal measures; but this is formed of hard wood, geologically of recent growth, and contains not enough of fixed carbon to be worth the mining; it burns but poorly, and gives out comparatively but little heat. In some places this lignite is from two to six feet thick, and gives a very disagreeable taste to the water passing through it. There are sands in large quantities well suited for the manufacture of glassware, and potter's clay of various kinds, adapted for either coarse or fine work. The iron ores, which have percolated through the sands and formed a ferruginous sandstone conglomerate, are to be found more or less at certain depths over the entire county; but these

are not sufficiently rich to be profitably worked, nor are the conglomerates hard enough or sufficiently solid to be used as building material. The soil is all drift, and when not too sandy, or of yellow clay basis, is very rich, producing excellent corn, cotton, tobacco, wheat, oats, rye, barley, and hay. On a tributary of Clark river is a large cypress pond, filled with choice trees of cypress, holly, oaks, gum, &c., whose foliage, falling for centuries, has created a tolerably good bed of peat. The face of the country is generally level, and sometimes rolling.

Timber.—Parts of the lands were, in the first settlement of the country, prairie or barrens, covered with long, luxuriant native grasses and flowering plants, with but little timber. The creek and river bottoms are wet lands, abounding in the very best quality of oaks, cypress, gum, pecan, hickory, walnut, cherry, maple, ash, leatherwood, ironwood, birch, beech, cottonwood, willow, hornbeam, sugar-tree, poplar, buckeye, cucumber tree, coffee-tree, elm, sassafras, dogwood, &c., &c. The undergrowth is spicewood, witch-hazel, thorn-bushes, prickley ash, hazlenut, cane, grape-vines, pea-vine, and every other vine and shrub indigenous to the quaternary formation. Large forests of this timber still remain untouched (probably not one fourth of the lands are cleared), but the farmers every year waste, and burn up in log-heaps, millions of feet of timber that, in the European markets, would be worth more than the price of their lands, sometimes a dozen fold. Extensive saw-mills prepare the lumber for home use and export, and every season ship out immense quantities of boards, staves, &c., &c.

Products.—Corn, wheat, oats, cotton, tobacco, flax, and hay are the chief farm crops. Graves is one of the largest corn, wheat, cotton, and tobacco-growing counties in Kentucky. Corn and stock are exported in quantities; wheat is raised largely in excess of home consumption, and the cotton and tobacco are almost entirely exported to foreign countries after it is sold in the markets of Paducah or New Orleans. The farmers of this county are a very hard-working, intelligent, thriving population, and every man sets out, each year, with a resolution to produce every ear of corn, bushel of wheat, and pound of tobacco or cotton that is possible with his land and labor. This continual press on the lands will, after awhile—in fact has already in some places—caused them to “tire” or “wear out,” so that it is the province of wisdom that the land-owner should pause a moment, and learn the necessity of returning something to the soil, in the place of the mineral and vegetable elements that every year have been taken from it. If this is not done,

only poor crops will respond to the heavy toil of the planter. A large part of the land carries fertilizers well; and if the chemical elements needed as plant food were each year applied by broadcast sowing before the crops are planted, the farmers could get more and better productions from half the lands, and with half the labor. What these "tired lands" need are green crops of clover, buckwheat, spurry, rye, oats, or cow-peas turned under with a large plow; also deep subsoiling and rotation system of crops. The mineral fertilizers needed are the superphosphates (bone-dust), gypsum or land plaster, potash, and nitrogen; these latter can be obtained from the German kainit, now sold in immense quantities in New York, Louisville, and other cities, or from the South Carolina marls and nodules. Fruits of all kinds, including the best quality of grapes, do well on the highlands, and rarely fail of a full crop. Berries and nuts flourish most luxuriously, and on "the barrens" strawberries grow wild in quantities almost beyond belief to a person who has never seen them in full bearing.

Live Stock.—The large corn and hay yield of this county makes it a cheap place for raising mules, cattle, and hogs. Since the war not much pains has been taken to improve the breeds of any kind of stock; but some enterprising farmers have brought into the county Short-horn, Devon, and Alderney cattle, Cotswold, Southdown, and Merino sheep, and Berkshire and Poland-China hogs. From these the native stock is gradually mixing, so that, within a few years, Graves will be able to exhibit some of the best bloods in the State. Hogs are great favorites with the farmers, on account of the short time it takes to bring the pigs into market, and the wide range of profit, particularly when there are good sweet-mast and large corn crops. The exports in hogs on the hoof, and also when made into bacon, increase each year, and is a leading traffic with many traders of men of capital.

Streams and Railways.—No large navigable rivers pass through this county, but the Mayfield and Clark's creeks and their tributaries thoroughly drain the lands, and afford plenty of water for grist and water-mills. The Paducah and Gulf Railroad passes directly through from north to south, giving easy and rapid communication with the Ohio river at Paducah, and with the entire southern country, by means of the extended railway system, reaching every cotton-growing State. Another road has been in contemplation, upon the narrow-gauge plans from Paris, Tennessee, to Cairo, Illinois, which, if ever built, will pass diagonally through the county from northwest to southeast.

TOWNS AND VILLAGES.

Mayfield, the county seat, is handsomely located on Mayfield creek, about the centre of the county, and contains about one thousand population. It has a good court-house, several elegant churches, large tobacco factories, saw and grist-mills, a woolen factory, two well patronized academies, about a score of mechanic shops, and many handsome private residences. *Boydsville, Boaz, Dublin, Clear Spring, Fancyfarm, Farmington, Hickory Grove, Kansas, Lynnville, Lowes, Viola, Water Valley*, and *Wingo Station* are all neat flourishing villages, each doing a large and prosperous local trade.

Home Factories.—Messrs. Albrittan & Thomas have a fine woolen factory, grist and saw-mill, at Mayfield, where they make annually, for export, goods and lumber amounting to over \$50,000. They are men of great enterprise, and lead in the factory business in this county. There are numerous other saw and grist-mills in the county, each of which does a considerable business. The ladies in the country still use the cotton-cards, the spinning-wheel, and the hand-loom for the manufacture of jeans, linseys, cottonades, counterpanes, blankets, linen, and other goods for home use and traffic. They also furnish to the outer world eggs, butter, poultry, feathers, pickles, and dried fruits in exchange for "store goods" and family supplies of groceries. The men never think of aiding in these smaller industries, but leave the burdens and profits entirely with the better portion of the race. In some neighborhoods, the high prices obtained for the very fine article of tobacco raised in this county have made the farmers so rich that even the ladies feel too proud to make music on those good old instruments, the wheel and loom, and depend upon the field crops entirely for all kinds of dry goods and groceries.

Education and Schools.—The common school system of the State has been inaugurated in nearly every district in the county, and public schools are taught, on an average, five months in the year. Nearly all the children over ten years of age can read and write, and parents seem anxious to have them well taught in all the branches of a good English education. In Mayfield are two good seminaries or academies, under the charge of competent professors, who take great pride in thoroughly educating the children intrusted to their care in the higher branches of science, literature, and the languages.

Religious Denominations.—The Cumberland Presbyterian, the Methodist, the "Iron-clad" and Free-will Baptist, the Catholic, the Presbyte-

rian, and Universalist are the principal religious churches in the county. There are some few Episcopalians, Unitarians, and Swedenborgians, but they have no regular congregations. Every neighborhood has one or more church buildings belonging to different denominations, or "joint churches," so that no family will have to go over four to five miles to attend public worship.

Manners and Customs.—The people are honest, frank, generous, and hospitable, little given to ceremony, and exceedingly plain in the entertainment of their friends. To immigrants from other States or Europe, they would extend a cordial welcome, and be rejoiced to have them come and settle among them, and share the rich legacy which nature has furnished in fertile lands, a mild, healthy climate, good water, and abundant timber and fruits. They go for "free trade and sailor's rights," and have but little respect for any kind of privileged classes, except such as come from an outgrowth of real talent and good humanitarian deeds.

Future Prospects.—Graves must always be one of the best counties in Kentucky, and will no doubt some day support a population equal, pro rata, to any agricultural district in Europe. She will also become noted for her orchards and vineyards, just as she is now celebrated for her fine tobacco and hogs—a garden spot in "Jackson's Purchase."

GRAYSON COUNTY.

Grayson was formed from parts of Ohio and Hardin, in 1810, and named for Col. Wm. Grayson, of Virginia. It is bounded on the north by Breckinridge and Hardin, east by Hardin, Hart, and Edmonson, south by Hart, Edmonson, and Butler, and west by Butler and Ohio counties.

Geology and Soils.—The geological formation of this county is varied; about one half of the territory is based upon the sub-carboniferous, the other half on the true coal measures. All that part of the county lying north and east of a line running diagonally from the northwest extrem-

ity to the southeast angle of the county lies on the different strata of sub-carboniferous limestones, while all south and west of this line is in the coal measures. There is, however, a ragged edge, and sometimes one and then the other formation is found overlapping this line. The Chester Group outcrops in many points in the county, and gives a peculiar character to the soil. In this formation occur the Grayson county marls, which are composed of calcareous fossiliferous shales, containing the mineral elements of plant food. They seem not to be so rich in plant food as the marls of South Carolina or New Jersey, yet some of the strata (for there are several of them, aggregating from 20 to 80 feet) are sufficiently rich to be of great service in restoring the red clay soils of the tobacco belt. The best of these marls are of a greenish hue, and of an unctious feel when first taken from their beds. These marls are found throughout the entire Chester Group, beginning at the Ohio river, in Breckinridge county, and following the coal measures around all the way to Crittenden and Livingston. At some places the strata are very thick, and at others almost nothing. The faults around the margin of the southern and western coal measures are so numerous and crosswise that probably the marl beds cannot be much utilized; they are, however, probably just as good in Breckinridge, Hart, Edmonson, and Butler counties as they are in Grayson. The coal formation in Grayson does not probably include all the strata that are to be found further west, but enough are here found to give an ample supply of fuel for all useful purposes, and to smelt iron ores for several centuries to come. Iron ores of excellent quality and in great abundance are found throughout the county. The Nolin Furnace, which went out of blast several years ago, proved these ores to be excellent for making a soft, tough iron, well suited for all shop purposes. The only drawback in making iron at this furnace was the cost of transportation, which the railroad system has now remedied. The soils of Grayson are generally about second-rate, and some very poor, but can be greatly improved by the use of marls, German kainit, bone dust, ashes, gypsum, and green crops plowed under. The bottom lands are quite rich. The creek bottoms are very fertile, and produce fine corn, hay, wheat, and tobacco, while the uplands are well adapted for flax, orchards, and vineyards.

Mineral Springs —The Grayson Springs have long been noted as one of the best watering places, with the finest hotel accommodations, in the West. Within the space of one acre of ground are over a dozen fine natural mineral springs of different kinds of water, and of different

temperatures, varying in this respect some eight to ten degrees. These springs are two and a half miles from the Southwestern Railroad, and are resorted to by large crowds seeking health and enjoyment. Chalybeate springs abound in many parts of the county, which are said to be very fine in curing chronic diseases.

TOWNS AND VILLAGES.

Litchfield, the county seat, is beautifully situated on a small creek, near the centre of the county, and contains about seven hundred inhabitants. It has a fine, new court-house, four or five elegant churches, a large academy, good school-house, several good hotels, a carriage and wagon factory, two large tanneries, over a dozen mechanic shops, and many excellent private residences. The Southwestern Railroad passes through the town, and gives transportation facilities to all parts of the country. The distance from Louisville is 73 miles.

Millerstown, near the line of Hardin county, is a beautiful village of one hundred inhabitants, located on Nolin river. *Caneyville*, thirteen miles southwest of Litchfield, on the railroad, is a pleasant village of one hundred inhabitants. It contains a fine church and school, and has a very large local trade with Grayson, Edmonson, and Butler counties. *Spring Lick*, *Millwood*, *Falls of Rough*, *Grantville*, and *Big Clifty* are all neat, thriving villages, with good local traffic.

Streams and Water-power.—Grayson county is divided by a series of ridges—Reedy Ridge, Caney Ridge, &c.—which gives two “watersheds,” one towards Nolin and Bear creek on the south, and the other towards Rough river on the north. These streams, with their tributaries—Big Clifty, Little Clifty, Short, Canoloway, Caney creek, &c.—give abundant drainage to every part of the county, and afford some of the finest sites for mills, furnaces, or factories to be found in the State, where coal, iron ores, and timber, without limit, are everywhere adjacent and easy of access.

Churches.—The Catholic, Baptist, Methodist, Presbyterian, and Reformer are the principal Christian denominations. Churches are conveniently located, so that every neighborhood has one or more, and every family can find “meeting on Sunday” within five miles of their home.

Schools.—The public schools are taught in nearly every district in the county, and parents are taking great interest in the education of their children. At Litchfield, J. T. Gosnell has under his control the Litchfield Seminary, an excellent institution, at which the higher branches of

literature and languages are taught. There are also other private schools in the county, at which advanced students can study the classics and scientific branches when desired.

Crops and Live Stock.—Corn, wheat, oats, hay, and tobacco are the principal crops. The lands are not so well adapted to corn as they are to small grain, tobacco, flax, fruit, and vineyards. With proper care, orchards, flax, and vineyards could be made most valuable crops. The patented flax-brake, which cleans, at little expense, from 800 to 1,000 pounds a day, if used in this county, would prove this staple to be one of the best adapted for money-making. Peaches scarcely ever fail of a full crop, and grapes can here be made to yield over 10,000 pounds to the acre of Concord, Ives Seedling, Delaware, Catawba, or other native varieties. From the vineyards wine and brandy can be made equal to the best foreign brands, and as cheap in price as they are in France or Spain. Sheep husbandry can be as profitably followed here as in any place in America. The breeds of horses, cattle, hogs, and sheep have been and are being improved every year, and will soon be as good as in any of the neighboring counties.

Domestic Arts.—A large amount of jeans, linseys, linen and cotton cloths, blankets and counterpanes, are made at home by the farmer's wives and daughters each year, and quite a traffic is kept up with the stores and hucksters of Louisville in these articles, and also in butter, eggs, chickens, turkeys, ducks, guineas, dried fruit, socks, maple sugar, molasses, and ginseng. These are traded in quantities sufficient to pay the greater part of all the family expenses. The people are intelligent, hospitable, and thrifty, and are anxious to have immigration come in from other States or countries and settle among them, and aid in developing the country.

GREEN COUNTY.

Green county, formed in 1792 from parts of Lincoln and Nelson, was named in honor of Gen. Nathaniel Green, and is bounded on the north by Larue and Taylor, east by Taylor and Adair, south by Adair and Metcalfe, and west by Metcalfe, Hart, and Larue.

Geological Formation and Soil.—This county lies on the lower strata of the Lithostrotion or cavernous limestone and the upper of the Waverly series, and in some places reaches the “knobby” formation. The surface of the country is generally undulating, in some parts hilly and broken. The west half of the county is based upon red clay and limestone, while the east half is intermixed with the Waverly and knobs. The soil is not so rich as in other formations, but is free-producing and easy of cultivation. Where the lands are inclined to be slashy or wet, tile-drainage, lime, gypsum, and superphosphates could be profitably used. Green crops plowed under would be good fertilizers for the limestone soils, to which might be added gypsum, German kainit, and superphosphates and ashes. There are no minerals of consequence in this county, and no coal; but probably some coal oil may be found similar to that in Barren county, and possibly even in greater quantities.

Streams and Water-power.—Green river flows from east to west through the centre of the county, and with its tributaries drains the entire district. Being above slack-water navigation, this river and its branches afford many fine mill-sites, with excellent water-power.

Timber.—There is much good timber in Green county; but the cavernous limestone lands are more productive of corn, wheat, oats, and tobacco than of timber trees; accordingly, the best forests are in the northern and eastern parts of the county, or along the river and creek bottoms.

Crops and Fruits.—While the uplands cannot be strictly called first-class, yet they are well adapted to the growth of all the cereals, flax, and tobacco, and produce good orchard grass, red-top, timothy, Hungarian, and millet. Fruit of all kinds do well, and apples, peaches, pears, quinces, plums, and some varieties of cherries, seldom fail of producing a full yield. Grapes can be raised here to great advantage, and the native vines, such as the Four Stars, Concord, Ives Seedling, Hartford Prolific, Delaware, &c., if properly tended, could be made to do as well as in any part of Ohio or Missouri.

Live Stock.—The people of Green have paid more attention to farm crops than fine breeds of stock; consequently the descendants of the old cattle brought by the first settlers from Virginia and North Carolina still hold undisputed possession in the county, while the "razor-back," long-faced swine, educated to eat mast and root for a livelihood, by the unerring laws of "selection and inheritance," roam masters of the woods. The sheep, too, are of the hardy, native breeds, that feed themselves and produce small fleeces of wool. But of late years, several enterprising, public-spirited farmers are beginning to seek for better pedigrees, and in a few years will have the county well stocked with Short-horns, Berkshires, Poland-Chinas, Cottswolds, Merinos, and South-downs. This is an excellent county for sheep husbandry and bee culture.

TOWNS AND VILLAGES.

Greensburg, the county seat, is handsomely located on the north bank of Green river, about the centre of the county, and contains 400 inhabitants. It has a good court-house, four churches, fifteen stores and groceries, several mechanic shops, an academy, and many neat residences.

Osceola, eight miles from Greensburg, is a thriving town of 100 persons.

Allendale, Powder Mill, Summerville, Tampico, Moodyville, Haskinsville, and Catalpa Grove are all neat villages, each doing a thriving local trade.

Schools and Churches.—The free common school system of the State, under the energetic charge of Joseph Perry, Esq., the present effective Commissioner, has become popular with the people, and schools are taught in every district, and the citizens show a commendable zeal in reaping all possible advantages therefrom for the benefit of their children. The Ironside Baptist, the Presbyterian, Methodist, Reformer, Missionary Baptist, and Universalist are the principal religious denominations in the county. The church houses are not elegant, but are comfortable and commodious, and the members feel that it is better to have true piety and honest faith than glittering cupolas, loud-sounding organs, or sermons from high-salaried priests or preachers.

Domestic Arts.—The industrious, frugal women of Green county have not forgot how to use the cotton-cards, the spinning-wheel, and the hand-loom; consequently, they still make at home most of the cloth used for every-day wear. They traffic their jeans, linseys, cottonades, blankets, home-knit socks, and linens to the merchants for groceries and "store goods," and rarely fail to take in exchange the jaunty hat or

bonnet, the hoopskirts, and the latest style of dress goods for Sunday wear. They also sell quantities of poultry, eggs, beeswax, feathers, ginseng, butter, maple sugar, and tree molasses; by means of which they often more than half support the whole family. The ladies are the "salt of the earth" here, as they are everywhere when they are sensible enough not to give themselves up to French fashions and foolish dressing.

General Characteristics of the People.—There is in no country a more honest, intelligent, industrious population than that of Green county, or one more social, friendly, and hospitable. Descended from the good old Virginia and North Carolina stocks of people, they have never learned how to be otherwise than upright and just, and have always been taught to regard every man entitled to confidence and companionship who can show himself worthy by his industry, intelligence, and good moral behavior. They know the need the country has of a greater development, and are therefore anxious to welcome with true Kentucky hospitality all immigrants who may desire to better their fortunes by settling among them. This county presents many advantages to colonies wishing to move from Europe or the Northern States into our favored Commonwealth.

GREENUP COUNTY.

This county, named for Gov. Christopher Greenup, was formed in the year 1803 from a part of Mason, and is bounded on the north and northeast by the Ohio river, which separates it from the State of Ohio, southeast by Boyd, south by Carter, and west by Carter and Lewis counties.

Topography, Geology, and Soil.—Situated in the extreme northeastern part of the State, on the waters of the Ohio, Tygart, and Little Sandy rivers, this county presents some of the best sites for mills, furnaces, and factories, with abundant water-fall, to be found in the State. The land is based on the coal-bearing rocks, except where the creeks and rivers cut through to the sub-carboniferous rocks (which are very thin here), or to the Waverly series. Coal and iron ores are found in every part of the county, and timber of the best quality for wood-work, furni-

ture, or fuel for iron making. Dr. David Dale Owen, in his report on the minerals of this section, says: "Greenup county (which then included Boyd) deserves the first place in the whole State of Kentucky for its mineral wealth. It has in abundance beds of iron ore of excellent quality, thick veins of fat cannel coal, and with this a most favorable position along the Ohio river, which facilitates the transportation of the products of its mines, already transformed by its numerous furnaces and oil factories. The formation of the numerous veins of iron ore, which cover the whole extent of Greenup county, the northern part of Carter, and the south of Scioto county, Ohio, is a geological problem of the greatest interest." The ores of this region belong to the carbonates or siderites, known as clay iron-stones, limonites, or hydrated peroxides, and might be called stratified deposits, although some of them occupy irregular geological levels, and appear to be in separate beds or pockets. They are known also as limonite ores, block ores, and kidney ores, and vary in quantities and thickness of strata from a few inches to many feet. These ores and coals, as well as those of the balance of the State, are fully described in the valuable Geological Reports of the State, the first series by Dr. Owen, and the second series by Prof. N. S. Shaler, which see. The surface of the country is hilly and broken, with river and creek bottoms of very rich lands. The ridges and hillsides are usually second-rate soil, and sometimes rocky, but produce corn, tobacco, vegetables, and all the cereals well, and are finely adapted for orchards and vineyards. Fruit trees grow most thriftily, and very seldom fail to produce a good average crop; peach trees, which so often fail in the lowlands, rarely miss bearing on the uplands of this county.

TOWNS AND VILLAGES.

Greenup, the county seat, beautifully situated on the Ohio river, immediately above the mouth of Little Sandy river, is a flourishing manufacturing town of about eight hundred inhabitants. It has a good court-house, two academies, several churches, iron-works, mechanic shops, bank, saw and grist-mills, and many handsome private residences.

Riverton, one and a half miles above Greenup, and really a part of it, has about one hundred people, and is the terminus of the Eastern Kentucky Railroad, which is partially completed, and running to Grayson, in Carter county.

Hunnewell, eight miles out on the Eastern Kentucky Railroad, is a thriving town of over five hundred inhabitants. It has a large furnace, railroad machine shops, and several large stores, churches, schools, mechanic shops, mills, and other factories.

Laurel Furnace, *Pennsylvania Furnace*, *Raccoon Furnace*, and *Buffalo Furnace* are all growing places, at each of which a large business in iron, coal, &c., is done.

Argilite, *Lima*, and *Duwall's Landing* are places of considerable commerce and local traffic.

Factories and Furnaces.—There have been twelve to fifteen furnaces and iron-works built in this county, some of which, owing to the low price of iron and tightness of the money market, are out of blast, while others are making large quantities of pigs, blooms, and bar iron. The statistics attached to this volume will show the yield in the several counties of the State. Wool factories, railroad shops, grist and saw-mills, and other manufacturing establishments, are located in Greenup county; but as yet not one tenth of what should be, in order to fully develop its resources.

Timber.—It would seem that nature had done enough for Greenup county in filling its soil with coal and iron; but in her profusion she has here given some of the finest forests of every class of timber to be found in the Ohio Valley. The principal trees, many of which are very large, to be found in the forests, are all kinds of oaks, poplar, beech, chestnut, hickory, gum, ash, linden, sycamore, buckeye, elm, walnut, butternut, hemlock, spruce, pine, cedar, persimmon, cherry, locust, cucumber tree, birch, hackberry, mulberry, willow, hornbeam, catalpa, dogwood, sassafras, holly, papaw, redbud, sumach, crab-apple, wild plum, leatherwood, witch-hazel, laurel, spice-wood, and numerous shrubs, vines, and cane.

Schools and Churches.—The public school system of the State has been inaugurated, and now free schools are taught in every district, and the people are much more in favor of general education among their children than formerly, and take more care to have them attend regularly. The principal religious denominations are the Catholic, Lutheran, Baptist, Methodist, Presbyterian, Reformer, Episcopalian, and Universalist. Some of the churches are very fine specimens of architecture, others of more primitive structure, but all generally well attended. There are quite a number of foreign born miners in this county, who usually attend the same churches, and have the same societies and amusements they had in the fatherland.

Live Stock.—There has been no care taken to improve the breeds of any kind of stock, therefore the old scrub horses, cattle, sheep, and swine rule supreme, and will do so for some time to come, unless some intelligent, public-spirited farmers will attend to importing new breeds from the blue-grass counties of the State, or from elsewhere. The country is well adapted for cattle-raising, sheep husbandry, and bee culture.

HANCOCK COUNTY.

This county was formed in 1829 from parts of Daviess, Breckinridge, and Ohio counties, and named for John Hancock. It is bounded north by the Ohio river, which separates it from the State of Indiana, east by Breckinridge, south by Ohio, and west by Daviess county.

Geology and Soils.—The carboniferous series underlie this entire county, and coal can be found in every neighborhood. The face of the country is rolling, and in some parts quite hilly. The lands along the river and creek bottoms are first-class for corn, tobacco, and the cereals. The uplands, though not of the first quality, are adapted to the growth of fine tobacco, flax, all kinds of fruits, and cereals. The coal shows itself in nearly all the creek beds and ravines. At Hawesville and other places it is mined in large quantities, and sold to steamboats, and shipped to the towns and cities along the Mississippi river. The Breckinridge cannel coal, which is mined near the county line, is equal to any similar coal in the United States, either for fuel or the distillation of coal oil or paraffine. The "Tar Springs," in this county, are quite noted for the large amount of bitumen, maltha, and asphalt which exudes from the earth in a constant discharge.

Timber.—The forests of this county contain nearly all the varieties of wood indigenous to the north temperate zone, many of the trees being of immense size, particularly on the river and creek bottoms. The wild cherry, plum, persimmon, haw, papaw, and crab-apple are among its wild fruits, and grape-vines of large size grow everywhere in the forest.

TOWNS AND VILLAGES.

Hawesville, the county seat, is eligibly located on the Ohio river, nearly opposite Cannelton, Indiana, and contains about 1,000 inhabitants. It has a fine court-house, several elegant churches, a large academy, many manufacturing and mechanic shops, steam mills, and several costly residences.

Lewisport, with a population of some five hundred persons, and *Pellville*, with one hundred persons, and *Patesville*, with seventy-five persons, are each flourishing towns, with large local trade.

Crops and Fruits.—Corn, wheat, hay, and tobacco are the chief crops, though other cereals and much clover and other grasses are grown. The beech lands make excellent meadows, on which large crops of hay are raised for export to the Southern markets. The hills and rolling lands are peculiarly well adapted for orchards and vineyards. Apples, pears, peaches, plums, cherries, damsons, and all small berries and nuts flourish with great luxuriance, and seldom fail to make a full crop every season. As far as vineyards have been tried, they have proved a success, when the native vines are planted. The wine made from these grapes have a large per centage of saccharine matter, with a delightful aroma.

Live Stock—The majority of the stock is of the old native unimproved breeds. There are, however, several influential, public-spirited farmers, who are endeavoring to introduce better pedigrees of horses, cattle, sheep, and hogs. The success so far has been quite marked; and there is good promise of Hancock county having hogs, cattle, and sheep, within a few years, that will compare favorably with any in the western part of Kentucky. Sheep husbandry would pay here finely. The wool of the improved Merino, Cottswold, or Shropshiredown equals the best fleeces from the same breeds to be found in any part of the Union. Mules can be raised to great advantage in this county. The meadow lands hold the grass under such vigorous growth that they need stable feeding not more than from three to four months in the year.

Navigation.—The Ohio river gives transportation facilities to all parts of the county, which it washes nearly half its border distance; so that no neighborhood has to haul its produce over ten to fifteen miles. Most of the coal mines, saw-mills, and flouring-mills are located near the river, where they can ship their products with very little cost.

Churches.—The chief denominations are the Catholic, Methodist, Baptist, Reformer, and Presbyterian, although quite a number of Episcopalians, Unitarians, and Universalists are in the county. The church

buildings are generally good, and conveniently located in every neighborhood.

Schools.—The public school system of the State is generally organized in the county, and schools taught in nearly every district. More interest is manifested each year in the subject of education, and parents are more disposed to give their children the advantages to acquire learning from the general plan of public instruction. There is a good academy at Hawesville, and several private schools of high grade in the county. The colored people do not seem much interested in having their children taught, but are improving every year in educational interest.

Smaller Industries.—The female portion of the community are exceedingly energetic and industrious, and manufacture from the cotton, flax, and wool produced on the farm large amounts of jeans, linseys, linens, cottonades, blankets, towels, counterpanes, and other useful articles, both for home use and traffic. The spinning-wheel, the cards, and loom are indispensable pieces of furniture in most of the farm-houses, and their music is heard throughout the entire land. There is also a profitable traffic carried on in butter, eggs, poultry, feathers, beeswax, honey, hand-knit socks, ginseng, feathers, and dried fruit. There are some of the best apiaries in the State in this county, which prove very profitable. During the latter weeks of the winter season the maples or sugar-trees are tapped, and thousands of gallons of their juice or sap are boiled down into most excellent home made molasses and sugar. The larger manufacturing employments have not been much developed, although the raw materials of wood, coal, and farm products are everywhere at hand.

Chalybeate and Sulphur Springs.—There are several very fine mineral springs, which afford excellent water for invalids suffering under chronic diseases; but few of them have been fitted up as fashionable watering-places. In the future, no doubt, these will become places of great resort. "Copperas water" is prevalent in some neighborhoods; but generally the springs are very pure limestone or freestone, without any other foreign substances discernible in the water.

HARDIN COUNTY.

In the year 1792 this county was taken from a part of Nelson, and named in honor of Col. John Hardin. It is bounded on the north by Meade and Bullitt counties, and by the Ohio river, which separates it from Harrison county, Indiana, east by Bullitt, Nelson, and Larue, south by Larue, Hart, and Grayson, west by Grayson, Breckinridge, and Meade counties.

Geology and Soil.—This county is quite varied in its geological formations. Beginning on the northeastern border with the Devonian shale, it passes through the knobby and Waverly series, the sub-carboniferous limestones (which are thin), and reaches the true coal measures on the southern border of the county at Millersburg, in the edge of Grayson county. The soil varies, according to the rock formations, from the "sobby beech" lands, through the knobs and poor lands of Muldraugh's Hill, into the light sand lands of the Waverly, and then into the barren cavernous limestone lands, which are rich, and on to the sand rocks underlying the coal beds. There is no coal of consequence in the county, and but little iron ore. Much of the soil is quite fertile, other parts thin, and some exceedingly poor in plant food. A majority of the land, however, is based on the sub-carboniferous limestone, and is very productive of tobacco, flax, and all the cereals. The elevation of Muldraugh's Hill, and the continuous high lands after the elevation is reached, adapts the country for fruit-raising, and accordingly we find that peaches, apples, pears, quinces, plums, cherries, strawberries, nuts, grapes, and all other kinds of small fruits and berries, flourish as well as in any part of the Western country, and rarely ever fail to produce good crops, even when the other portions of the country make a complete failure.

Transportation and Traveling.—No county in the State is better provided with conveniences for traveling and transportation than Hardin. The Ohio river gives an outlet by water at West Point, the mouth of Salt river; the Louisville and Nashville Railroad runs north and south through the county; the Elizabethtown and Paducah Railroad begins at Elizabethtown and runs southwest through the county; the Elizabethtown and Lexington Railroad is to run southeastwardly; and the Louisville connection with the Elizabethtown and Paducah Railroad already runs entirely through the western part of the county.

TOWNS AND VILLAGES.

Elizabethtown, the county seat, is handsomely located on Severn Valley creek, on the Louisville and Nashville Railroad, 42 miles from Louisville. It has a population of about twenty five hundred inhabitants, a good court-house and other public offices, machine-shops, half a dozen elegant churches, many fine stores, two academies, a dozen mechanic shops, saw and grist-mills, wooleed factory, and many elegant private residences.

Colesburg, *Tunnel Hill*, *Glendale*, *Sonora*, and *Upton* are flourishing towns and depots on the Louisville and Nashville Railroad. *West Point* is a town of three hundred inhabitants, at the mouth of Salt river, and also on the Ohio river, and on the Louisville branch of the Elizabethtown and Paducah Railroad. The other depots in this county on this road are *Muldraugh*, *Tiptop*, *Stithton*, *Farleigh*, *Vine Grove*, *Otter Creek*, *Rileyville*, *Bethlehem*, and *Cecilian Junction*, and on the Elizabethtown and Paducah road are *Longrove*, *Stevensburg*, *Eastview*, and *Summit*.

Manufactures and Water-power.—Salt river (on the northeast of the county), Rolling Fork, Nolin, Otter creek, and their tributary branches, afford many excellent sites for mills, furnaces, and factories. At Elizabethtown are located extensive railroad shops, and many small factories, grist and saw-mills, and at other railway stations are different kinds of factories and mechanic shops in successful operation.

Schools and Churches.—*Cecilian College*, at Cecilia Junction, is under the control of H. A. Cecil & Bros. It has six professors and a large number of students. *Lynnland Institute*, at Glendale, under the charge of W. F. Perry, President, has a beautiful location, is well patronized, and ably conducted. The academy at Elizabethtown, under the control of Rev. Mr. Heagan, is a first-class high school, well patronized. There are several other private schools in the county, besides a public school, under the State free common school system, in every district. The Catholic, the Baptist, the Reformer, the Methodist, the Episcopalian, the Presbyterian, and Universalist are the principal religious denominations. There are several very elegant church buildings in the county, and nearly all of them are commodious and comfortable. Every neighborhood is provided with one or more of these church buildings, and the congregations are usually quite large at all the churches.

Crops and Fruits.—Corn, wheat, oats, and tobacco are the chief staples. Herds-grass, timothy, clover, orchard-grass, Hungarian, and millet grow well either for hay crops or pasturage, and are extensively sown

every year. The *king* crop is *tobacco*, which is largely grown, and sold in the Louisville market. The contiguity of such a city as Louisville naturally induces many large planters to cut up their farms, and change their labor to garden and fruit farming, which is far more lucrative than the old plan of staple crops. Large orchards, vineyards, and strawberry and other small fruit beds, are being planted every year, and such as have come to bearing are very profitable. Poultry and honey-raising are also beginning to be more extensively engaged in, with good results. Butter, milk, lambs, pigs, and vegetables have also become articles of profit, and are sold at the depots at fair prices to the hucksters, who are always on hand when there is anything to sell. The people have pretty much quit making jeans, linseys, and other kinds of home-made cloths since the market-gardening, fruit-raising, dairying, and garden-farming pay so much better. There are few countries where sheep and bees flourish better than in Hardin.

Social Features.—The people of Hardin county are eminently social, intelligent, industrious, refined, and hospitable. Nowhere is there a more high-toned class of society, entirely free from sectarianism, political or religious intolerance, and without that selfish feeling of aristocratic pride which we sometimes find in the cities and old countries, where great wealth has accumulated. This is an excellent county for immigrants seeking good homes and good society to settle in, and the people will welcome them most heartily to come and live among them.

HARLAN COUNTY.

In 1819 Harlan county was formed from parts of Knox and Floyd, and named for Major Silas Harlan. It is bounded on the north by Perry and Letcher, east and south by the State line of Virginia, and west by Bell county.

Topography and Geology.—This county is situated in the southeast corner of the State, and is located upon the carboniferous and sub-carboniferous rocks. The face of the country is exceedingly mountainous and rough. The Kentucky Ridge, Pine Mountain, Black Mountain,

Little Black Mountain, and the Cumberland Mountains, all pass from southwest to northeast through the county. Between the Pine Mountain range and the Kentucky Ridge range is a fault which runs from the northeast to the southwest, passing into Tennessee. The result of this fault is to drop the higher strata of the coal measures, so as to bring them nearly on a horizontal plane with the flow of the water-courses. Along the brink of this fault appear many strata of the palæozoic cycle of rocks. It has been reported that gold, silver, and copper ores were here found. Such a discovery is not impossible, as fissures, through which veins of metalliferous fluids might have passed, could have ensued very naturally during the epoch of this great disturbance, yet it is hardly probable that such action did occur, as geologists have thus far failed to find any granitic or volcanic rocks in their natural positions; and as these formations universally accompany metalliferous veins, containing the precious metals, even when imbedded in quartz, we are led to infer that they do not exist in this section of the country, and that the tales of silver and gold in quantities, or in regular vein lodes, are altogether imaginary. The Unaka range of mountains, situated some seventy-five to one hundred miles to the southeast, at the nearest point from this county, in North Carolina, Tennessee, South Carolina, and Georgia, are based upon rocks of Plutonic origin, and not upon the aquatic formation; and in these are found numerous quartzose and metalliferous veins, as, for instance, those at Ducktown and elsewhere. Iron ores exist in large quantities, which belong to the family of limonites or hydrated oxides and proto-carbonates of iron. These vary much in richness, affording from twenty-five to seventy-five per cent. of metallic iron, and usually lie on or between beds of shale, or near to the mountainous limestone beds. Coal exists in large quantities, and at some places the beds are from six to fourteen feet thick. These coals are bituminous, and also cannel or semi cannel, and of excellent quality. Coal oil, no doubt, may be found in many localities, where it has been kept pent up by the action of faults, so as not to flow off into the lower countries towards the west. Mineral springs abound, of qualities equal to any found in similar mountainous regions.

Soil and Timber.—The valleys are very rich, and produce corn, wheat, oats, hay, and tobacco; the north and west sides of the hills and ridges are very fertile, while the opposite sides are more rocky, thin, and sterile; the ridges are poor and generally sandy. There is a growth of mountain grass, very nutritious, everywhere among the mountains, peculiarly suited to the grazing of cattle and sheep. Many persons from

the level lands of Kentucky and Virginia are in the habit of driving sheep and cattle here in the spring, and in the late fall drive them back as fat as it is possible for them to be. The timber of the mountains is almost untouched, and is in ample quantities to last for many centuries. The principal growths, some of which are of immense size, are pine, hemlock, spruce, arbor vitæ, all kinds of oak, poplar, buckeye, ash, walnut, cherry, hickory, gum, cedar, holly, elm, chestnut, sugar-tree, maple, locust, hornbeam, ironwood, wahoo, redbud, aspen, willow, cottonwood, cypress, fir, larch, black-jack, cucumber-tree, dogwood, &c., &c. Wild fruit and nuts are very abundant, such as crab-apples, plums, chinquapins, whortleberries, haws, grapes, ground cherries, may apples, hazelnuts, filberts, blackberries, raspberries, dewberries, strawberries, &c.

Crops, Orchards, and Vineyards.—Corn, wheat, oats, rye, hay, flax, and tobacco are the chief productions. Flax grows as well here as it does anywhere in the State, and could be made a leading staple. The farms are generally small, and the farmers are so remote from market that they do not strive for large crops. Fruit of all kinds, apples, peaches, pears, quinces, plums, cherries, and all sorts of small fruit and berries, grow to perfection, and never fail of making a full crop. In the future this county will, in all probability, be the paradise of shepherds, fruit-raisers, and wine-makers. Nowhere can better grapes or wine be produced than on the southern and eastern slopes of the ridges and mountains of Harlan, having, as it has, the climate and soil similar to that of the Appennines and Alps in Europe.

Sheep Husbandry.—Pastoral life among the mountain meadows of this section would be all that poets have pictured it. Here are the wild grasses, the bitter shrubs, and the tender buds of the mountain undergrowth. Sheep flourish as well as in any part of the world, and produce the finest and largest fleeces of wool. As yet, wild game is too plenty, and the valleys produce corn too copiously, to withdraw the people from the chase and the romance of little work and hard fare; consequently the sheep-raising, like other industries, is but little practiced, except by persons from the level counties, who sometimes, as before stated, drive their flocks to the mountains to fatten.

TOWNS AND VILLAGES.

Freedom of air, with the privilege of hunting over a large territory, is a boon too dear to a Harlanite to permit him to confine himself within the limits of a large city or a pent up town; therefore, we find no great

metropolitan centres of manufactures or commerce within the limits of this county.

Mount Pleasant, beautifully located on the north side of Cumberland river, or the Poor Fork of Cumberland, contains a population of about seventy-five persons, and is the only town of importance in the county.

Leonard, Clover Fork, Poor Fork, and Wallin's Creek are small, neat villages, that do a considerable local traffic in the smaller industries of the country and peltries. The tall mountains, the beautiful cascades, and many natural wonders, and the marvelous scenery, seem to create a spirit of independence in the people, and develop a full and free action of the muscles, the vision, and the imagination; therefore no close carriages, and not many wheeled vehicles are used; but they thread their courses through the hills by the bridle-paths upon horseback, or else in the primitive manner of our forefathers on foot, and are never shocked by the loss of relatives or friends through the negligence of carriage or wagon drivers and railway engineers.

Schools and Churches.—The sparseness of population makes it difficult to keep up good schools; yet the public school system is prevalent in the county, and schools are taught in nearly all the districts. The Baptist, Methodist, and Reformer are the principal denominations of Christians. The church buildings are of primitive structure, consisting generally of logs, nicely hewn, and covered with shingles or boards; but the church members are intelligent, honest, and faithful, and feel that piety dwells in the heart and not in the fine mansion.

Small Industries.—The women of Harlan are very intelligent, energetic, and frugal. They are the chief manufacturers of the land, and make, from the native grown cotton, wool, and flax, quantities of jeans, linseys, cottonades, flannels, linens, blankets, counterpanes, comforts, towels, and hand-knit socks, which they traffic for "store-goods." They also traffic largely in honey, beeswax, ginseng, butter, eggs, poultry, feathers, dried fruits, and home-made sugar and molasses. The old hand-loom and spinning-wheel are popular pieces of house furniture, and can be seen in every house and heard gently echoing through every vale.

Hunting and Fishing.—Game of all kinds abound in the mountain forests, and even bear, wildcats, and panthers are still quite plenty. The male portion of the population love the chase, and equal Izaak Walton with the gig or the hook and line, and, under excitement, would even leave the plow to enjoy these sports. They are excellent marksmen, and when their rifles are leveled at any kind of game, they are apt to carry home the scalp.

Water-power.—The upper tributaries of Cumberland river, which run through this county, have numerous water-falls which are ample to drive a large amount of machinery, and afford good sites for mills, forges, and furnaces.

HARRISON COUNTY.

In 1793 this county was formed from parts of Bourbon and Scott, and named for Col. Benjamin Harrison. It lies between "Dry Ridge," a continuous spur of the Kentucky ridge of Cumberland Mountains, and Licking river, and is bounded on the north by Grant, Pendleton, Bracken, and Robertson, on the east by Robertson, Nicholas, and Bourbon, on the south by Bourbon and Scott, and on the west by Scott, Owen, and Grant counties.

Geology and Soil.—The whole of this county lies upon the upper Cambrian or lower Silurian formation, which varies considerably in the strata that come to the surface at different points. About one half of the county is gently undulating, while the other portion is inclined to be hilly and rough; but all is rich, arable, and very productive. Sulphates of lead and the sulphate of baryta, and occasional traces of iron ore, are the only metals found in this county, but none of them in quantities sufficient for valuable working. The subsoil is generally of a red or chocolate color, while the surface soil is a compost of decomposed calcareous marly limestones and vegetable mould. Blue-grass reigns here supreme among the grasses, and corn and hemp grow to perfection.

Agriculture.—Harrison is eminently a stock county, and the best breeds of horses, cattle, sheep, hogs, and poultry are to be found in every neighborhood. It would be hard to find "scrub stock" so far in the centre of the blue-grass country. Corn, wheat, barley, rye, oats, potatoes, and tobacco are the staple crops. The farmers refrain from shipping off the best elements of their soil in grain, but wisely convert it into fat and butter, thus selling carbon, which can be easily restored at a small cost, or else they put it into Bourbon whisky, which is the drink and the pride of the people throughout this section of Kentucky.

Large numbers of fine racing and trotting horses and good tough mules are bred in Harrison, and also herds of the best blooded Short-horns, and Cottswold, Merino, and Southdown muttons, all of which are exported and sold at fine prices after the home demand is satisfied. Harrison county is as completely engaged in the manufacture of "Bourbon county whisky" as Bourbon itself, and makes just as good an article. Fruits of all kinds grow well, particularly on the hills.

Streams and Water-power.—Licking river forms the northeast boundary of this county, and South Licking passes centrally through the county from south to north. These streams, with their tributaries, give excellent drainage to the whole country, and afford many good sites for mills, distilleries, and factories, with ample water-power.

Distilleries and Factories.—There are in Harrison county over thirty distilleries, which annually manufacture more than 50,000 barrels of Bourbon whisky, equal to any that bears that name in the world. Most of this is made from sour-mash, and from grain raised upon the marly blue limestone soil, which is five per cent. richer in alcohol than other grain, and from spring water impregnated with those peculiar elements that give the fine bouquet and elegant flavor which render these liquors so famous throughout this country and Europe. There are numerous grist and saw-mills, woolen factories, and wood-shops, and other smaller kinds of factories in the county.

Traveling and Transportation Facilities.—Licking river is navigable for keel and flatboats; but the great thoroughfares for travel and freight is the Cincinnati and Lexington Railroad, which runs centrally through this county from north to south, and the Cincinnati Southern Railroad, which passes along the western border of the county. These give daily communication with all parts of Kentucky and the Western country.

TOWNS AND VILLAGES.

Cynthiana, the county seat, beautifully located on the east side of South Licking river, has a population of nearly two thousand persons. It contains fine public buildings, good store-houses, seven or eight churches, three academies, banks, grist and saw-mills, distilleries, woolen factory, barrel factories, not less than forty mechanic shops, and many elegant private residences.

Claysville, on Licking river, has nearly one hundred and fifty inhabitants, and does a large local business.

Oddville, Havilandville, Antioch, Berryville, Colemansville, Boyd's Station, Robertson's Station, Connersville, Leesburg, Leeslick, Lair's Station,

Tricum, Buena Vista, Scott's Station, Sylvan Dell, Shady Nook, and Rutland, are all neat, thriving villages, at several of which are located large mills and distilleries and other factories.

Schools.—There are three excellent academies at Cynthiana, each under the charge of able professors, and largely patronized by Harrison and the adjoining counties. The public school of Cynthiana is one of the best conducted institutions of the kind in the West. It is under the control of Prof. L. G. Marshall and seven assistants. In several neighborhoods there are good high schools, and well taught private academies, besides the free common schools (taught under the general system of the State) in each district.

Churches.—The Baptist, Methodist, Catholic, Presbyterian; Reformer, Episcopalian, and Universalist are the principal Christian denominations in Harrison. The church buildings are scattered over the county, so that every neighborhood has from one to three, and these are always fine, and sometimes elegant. The members are highly intellectual and moral, and have nothing about them of that secular intolerance which is sometimes met with in the country.

Fairs.—*Abdallah Park* is one of the finest and best arranged fair grounds and trotting courses in the State, if not in the United States. It is located about one mile from the court-house at Cynthiana, and has a trotting track a mile around. The booths, stables, musician's stand, and pavilion seats are all of the best and most approved kind, and do honor to the managers of the "Harrison County Agricultural, Mechanical, and Live Stock Association," of which T. J. Megibben is President, and R. Collier is Secretary. The Patrons of Husbandry are very numerous in this county, and have done a great deal towards instructing the farmers in every branch of business connected with soil tillage and stock breeding.

The People.—Nowhere in Kentucky is there a better class of citizens than in Harrison county, and nowhere is there more intelligence, high-toned integrity, and true hospitality. The female portion of the community is refined, educated, and polished in manners. Thoroughly practical in every kind of female labor, they are the equals of their sisters elsewhere in the knowledge and practice of every art and science which makes home happy and life desirable. Immigrants who want good homes in the "Blue Grass Region" can find them ready made in Harrison county.

HART COUNTY.

In the year 1819 this county was formed from parts of Hardin and Green counties, called for Capt. N. G. T. Hart, and is bounded as follows: north by Grayson, Hardin, and Larue, east by Green, south by Barren, and west by Edmonson and Grayson counties.

Geology and Soil.—The sub-carboniferous limestone formation extends over more than three fourths of Hart county. In the west and north-western parts, the conglomerate and mill-grit sandstone come to the surface, and above these are a portion of the coal measures. The strata most prevalent are those known as cavernous limestone, though the oölitic limestones are in position on the high ridges and hills south of Green river. Much of the running water is underground, and caves, sinking springs, and hollows are everywhere to be found, many of which seem to have connections with the waters of Green river, as is evidenced by the caves and hollows being wet, and the springs rising from the back-water of the river. The entire country is cavernous, and probably the ramifications of the underground avenues may connect with the Mammoth Cave, or even with larger caverns than it. There are some good iron ores on Nolin, Round Stone, and Bacon creeks, and probably elsewhere in the county. These ores are similar to those in Edmonson county. The face of the country is generally rolling, and in some places quite hilly. The soil is a good loamy dirt, with a rich red subsoil, and produces good corn, wheat, oats, barley, hay, flax, and a most excellent quality of tobacco, known in the Louisville market as the "Bacon Creek Manufacturing Leaf."

Timber.—On the creek and river bottoms the timber is very heavy and of excellent quality, but on the uplands is mostly of young growth, taking the place of the old barren grass, since the fires have been kept out by the settlers. The prevalent barren growths are red and black oak, post oak, white oak, bigbud hickory, black-jack, elm, dogwood, sassafras, and gum.

Railroads, Rivers, and Water-power.—Green river runs east and west through the centre of the county, and, by means of locks and dams, is navigable most of the year. Nolin, on the western border, could be made an excellent navigable stream by the aid of dams and locks. As

it is, it affords many fine sites for factories, furnaces, and mills. Bacon creek flows east and west through the northern part of the county, and has on it many good mill-sites, as has also Round Stone and several other creeks. The Louisville and Nashville Railroad passes through the centre of this county from north to south, and affords easy and rapid communication every few hours with all parts of the Southern and Northwestern States. This road and its connections form one of the most gigantic railroad systems in the United States.

Crops and Fruits.—Corn, wheat, and tobacco are grown everywhere, and in great perfection. The hickory lands make an article of tobacco which is preferred by manufacturers of chewing-tobacco to all others that go into the markets of the West. The rich subsoil is an excellent repository for fertilizers of all kinds, and when the people once learn the proper method of using mineral fertilizers as plant food, the products of these lands will be greatly in excess of even the richest new grounds at present, on account of their peculiar adaptability to chemical fertilization. Peaches, apples, plums, some kinds of cherries, and quinces grow to perfection in Hart county, and on the highlands seldom fail to produce a full crop. The honey crop is profitable, owing to the large number of plants whose blooms and fruits generate food for bees. In all probability no other part of the country is better for bees than right here, where white clover grows spontaneously and buckwheat flourishes as well as in Pennsylvania.

Live Stock.—Much pains are now being taken by the energetic farmers of Hart to improve the breeds of horses, cattle, hogs, sheep, and poultry. The country is well adapted to each, although hogs seem to be the favorite, owing to the easy way of raising them, and the quick returns in selling them in pork when not much over one year of age. The favorite breeds are the Chester White, Red and Black Berkshire, Poland-China, Essex, and Woburn. The favorite sheep are the Cottswolds for the fleece and the Southdowns for mutton. Large quantities of poultry and eggs go every season from this county into the Louisville markets.

TOWNS AND VILLAGES.

Munfordville, the county seat, is well located on the north side of Green river, about the centre of the county, at the crossing of the Louisville and Nashville Railroad, and contains about three hundred persons. It has a good court-house, several nice churches, an academy, a dozen mechanic shops, and some very neat residences.

Woodsonville, immediately opposite, on the south bank of Green river, contains two hundred population.

Caverna, a town of about six hundred people, is beautifully located on the Louisville and Nashville Railroad, seven miles south of Munfordville. It has a good depot, two large hotels, several handsome churches, a dozen mechanic shops, tobacco factories, and many elegant private residences.

Monroe, Leesville, Bacon Creek, Rowlets, Woodland, Hardyville, Hammondsville, Camner, Barnettsville, Three Springs, and Priceville, are all pleasant villages, and each one does a large local trade.

Education.—While the people of this county have not paid as much attention to having good schools as they should, yet the public school system of the State is in very general operation in the various districts, and many private schools of a higher grade are taught in the county. At Caverna and Munfordville are good academies, under the charge of able professors, who take great pains to promote the education of the minors under their control.

Churches.—The church buildings are very good and conveniently located, so that no neighborhood is without one or more places of worship. The principal denominations are the Primitive and Missionary Baptist, the Methodist, the Presbyterian, the Catholic, and the Reformer. There are many Episcopalians, Unitarians, and Universalists scattered through the country.

Domestic Arts.—Formerly every family made all their home-wear on the spinning-wheel and old hand-loom; but since the introduction of railroad speed in everything else, the people have lost sight of these good old-fashioned pieces of furniture, and now "store goods" have nearly supplanted the "home-spun" of former times. There is a large traffic in eggs, butter, chickens, turkeys, ducks, guineas, geese, feathers, ginseng, dried fruit, maple sugar, and tree molasses. There are a few excellent nurseries in the county.

Gardening.—Great improvement has taken place within the last few years in horticulture. Most families now have good vegetable gardens, and many ladies are paying attention to floriculture, so that beautiful flowers are seen in the yards and gardens of many town, village, and country residences. Vegetables are frequently sent to the Louisville market along with the eggs, butter, poultry, and other smaller articles of trade.

What is Needed.—The lands of this county need rotation in crops, deep plowing, turning under of green crops of rye, clover, oats, field or cow-peas, buckwheat, and spurry, and a liberal dressing of land plaster, ashes and salt, or German kainit, gypsum, ashes and bone-dust, with care to prevent soil-washing by means of horizontal plowing.

HENDERSON COUNTY.

This county, named in honor of Col. Richard Henderson, was cut off from a part of Christian in the year 1798. It is bounded on the north by the Ohio river, which separates it from Indiana, east by Daviess and McLean counties, south by Webster and Union, and west by Union.

Geology and Soil.—Henderson county is based entirely upon the true coal measures of the Western Kentucky or "Illinois coal field," and contains probably as much coal as any other county. It has also the usual iron ores and lead found in this geological formation. A lead mine was opened and prospected in 1857 near McElroy's Gap, upon the Evansville, Henderson, and Nashville Railroad. No iron mines have been worked in the county. Artesian wells have been bored at and near the city of Henderson, from which flowed large quantities of salt and mineral waters. These waters are also found in springs at several places in the county. There are not less than from ten to twelve different beds or strata of coal in this county, some of which, however, are not thick enough for profitable working; but others vary from four to eight feet in thickness. The Ohio and Green rivers afford not less than sixty thousand acres of first-class bottom lands along their banks, which are as rich as any in the State, and produce very large crops of corn, wheat, and tobacco. The surface of these uplands is level or gently rolling, and the soil is generally a rich vegetable mould, based upon a good red or yellowish clay. This produces the cereals and a fine class of tobacco (particularly adapted to the stemming trade), and also good hay and grasses.

Transportation Facilities.—The Ohio and Green rivers supply never-failing water for steamboats of the largest size, and the Evansville, Hender-

son and Nashville Railroad, which runs centrally through the county, gives daily communication for freight and passage to all parts of the South. The Ohio river borders this county for fully seventy miles, and Green river flows along its eastern line for some distance, and then through the county, giving a navigation of forty miles.

Timber.—This was originally, and is still, one of the best timbered counties in the State, abounding in large forests of walnut, pecan, hickory, cypress, poplar, oaks of all kinds, gum, cottonwood, wild cherry, chestnut, maple, cucumber trees, ash, beech, birch, &c. The county is well supplied with saw-mills.

Agriculture.—This is one of the most favored agricultural sections of Kentucky. The large area of bottom lands, and the general fertility of the uplands, give Henderson a leading position among the corn, wheat, and tobacco counties of the State; and the facilities for shipment induce the farmers to raise large crops of hay for the Southern markets. The cities of Henderson and Owensboro are the leading points in the United States for putting up tobacco strips, and in Henderson alone are over twenty stemmeries and factories. Barley grows well, and of late years is coming into more favor as a standard crop. Peaches, apples, plums, cherries, quinces, pears, and all the lesser fruits, berries, and nuts flourish and yield full crops nearly every year upon the highlands, and grapes, so far as they have been tried, prove a success, both for table use and wine-making. Stock raising receives considerable attention in every part of the county, and good bloods of horses, cattle, sheep, hogs, and poultry have been, and are being, introduced by the more thrifty, energetic, and public-spirited farmers, so that more or less of the best pedigrees are to be found in every neighborhood. Bee culture has increased considerably within the last five years, and honey is easily produced in quantities for family use throughout the county.

CITIES AND TOWNS.

Henderson, the county seat, of between six and seven thousand inhabitants, is a well-built, handsome city, with a very large commerce for a place of its size. In population and manufactures of all kinds it is rapidly increasing, and bids fair to become the manufacturing centre for a large area of country. A more extended description can be found under the head of cities and towns in this volume.

Spottsville, *Bluff City*, and *Hibbardville*, on Green river, *Bushy* and *Robart's Station* on the railroad, *Geneva*, *Corydon*, *Zion*, *Cairo*, and

Smith's Mills, are all neat, thriving villages, each doing a considerable manufacturing business and neighborhood trade.

Schools.—The city schools of Henderson are models of their kind, and are the pride of every class of her citizens. Prof. M. Kirby is the able principal, and well has his labor been repaid in giving to this thriving city a school where nearly 1,000 minors are being educated, in a style not surpassed by any similar institution in America. The cost to the city is from \$12,000 to \$15,000 per annum, which is cheerfully paid by the citizens, who average as much wealth as in any other city of its size in the Mississippi Valley. There are several private schools in the county, besides the public schools taught under the system of the free schools of the State, in every district, so that every parent has a good opportunity of having his child educated; and if he fails to do so, it is his own neglect.

Churches.—The Catholic, Episcopalian, Baptist, Methodist, Presbyterian, Lutheran, Reformer, Unitarian, and Universalist are the religious denominations in this county. The church buildings are, many of them, elegant, and all well-built and commodious. The congregations are very intelligent, and usually give good attendance at the churches.

Domestic Industries.—The wealth accumulated by the citizens of Henderson has, in a great measure, paralyzed the good old habit of manufacturing home made cloth on the hand-loom; still this is done to some extent in the neighborhoods most distant from the city. Around the city the people are beginning to plant market-gardens, orchards, and vineyards, and to carry on a general system of garden-farming, which they find much more profitable than the old plantation system. Mixed cropping and a subdivision of labor works so well that the people are becoming anxious to cut up the large farms in order to develop more rapidly the great resources of their rich soil, and would welcome immigration with a view to this end.

Social Features.—The people of Henderson are eminently distinguished for their intelligence, high-toned morality, energy, and hospitality. There is with them no intolerance from religious, political, or social sectarianism; honesty and true worth alone give position, and every man can make for himself such a character as he desires. Being a wide awake community, they are rapidly pressing forward in all kinds of improvements on the farm and in the city, and are determined to be abreast of their neighbors of Kentucky and Indiana in whatever elevates, refines, and progresses the race.

HENRY COUNTY.

The year 1798, in Kentucky history, was noted for the number of new counties then formed, one of which was taken from a part of Shelby, and named in honor of Patrick Henry. It lies on the waters of the Kentucky river, which is the northeast boundary between Henry and Owen counties; Franklin lies on the southeast, Shelby on the south, Oldham and Trimble on the west, and Carroll on the north.

Geology and Soil.—Henry county is based upon the upper Cambrian or lower Silurian rocks, except some parts of the western and southern borders, that pass to the upper Silurian, and into the edge of the Devonian series. There are indications of several geological faults, by which the entire surface of the country and soil is changed within a few yards; so that on the different sides of a creek a complete change appears in the growth of timber and the productive qualities of the land. The surface of the country is generally rolling, and in some parts quite hilly. The "sugar-tree lands" on Little Kentucky river are the best in the county, and are remarkably fertile, producing the best of corn and hemp. The oak and hickory lands are the best for tobacco, and the beech lands for corn and hay. Blue-grass grows well in all parts of the county. The bluffs along the Kentucky river are frequently from three to four hundred feet high, and afford most excellent building rock. Lead ores have been found (and some silver reported), but not enough for profitable working. These lead ores exist in the Kentucky marble formation throughout the Blue Grass Region. Saline, chalybeate, and sulphur springs and wells are abundant, the most noted being Drennon Springs, near the Kentucky river, one mile above the mouth of Drennon creek. No doubt any neighborhood within the range of the lower Silurian rocks can have an artesian sulphur well, by boring from one hundred and fifty to three hundred feet, and until the calciferous sandstone of the Cambrian formation is reached, which contains within its porous fissures one of the great water-beds of the Ohio Valley.

Agriculture.—Hemp, tobacco, corn, wheat, barley, rye, oats, and potatoes are the principal staples of this county. They all grow well when the season is favorable; but, owing to careless farming, many of the richer elements of plant food have been drawn or washed from the sur-

face, and should be replaced by a judicious system of rotation of crops and fertilization with chemical compounds adapted to the needs of the soil. Some enterprising farmers—thinking men—like Judge Pryor, Prof. Dodd, A. B. Smith, T. F. Reese, J. Bruce, J. M. Crabb, J. G. Troutman, W. H. Kalfus, and others, are using every exertion to introduce the best classes of live stock, and to test, by experiments, the true method of farming through an intelligent system of fertilization of lands. The excellent grass and large corn crops grown in this county necessarily make it one of the best stock counties in the State, and the fairs at Eminence exhibit horses, mules, cattle, sheep, hogs, and poultry that cannot be excelled in the country. The contiguity of the Louisville and Cincinnati markets induces the farmers to engage largely in garden-farming, and in pasturing cattle for dairy purposes, which is found to be much more profitable than the old plantation system. Peaches, apples, pears, quinces, plums, cherries, and grapes flourish well, and many new orchards and vineyards are being planted with a view to the further subdivision of the labor on the farm. The high hills and ridges are peculiarly well adapted to the growth of peaches and grapes, and will, no doubt, be among the great sources of supply to the Louisville, Cincinnati, and the northern markets, of these delicious fruits and wines and brandies, which will come from a more extensive system of vineyards.

Transportation and Travel.—The Louisville, Cincinnati and Lexington Railroad branches in Oldham, and each branch passes through Henry—one running northeast and the other southeast. This, with the Kentucky river, which is navigable by steamboats, gives facilities for travel and transportation to every neighborhood, such as is possessed by few sections in the State. The Cumberland and Ohio Railroad has been surveyed through this county, and some grading done. If this is completed, it will give another outlet for travel and produce both north and south. Besides the Kentucky river, there is the Little Kentucky, Drennon, Sulphur, and other creeks, which, though not large enough for navigation, afford excellent water-fall, and many good sites for mills and factories.

Commerce and Manufactures.—The trade in agricultural, garden, orchard, and dairy products in this county is very large. Stock is quite an item of export, and many farmers are exclusively employed in importing young or poor stock from Indiana or other places, having them fattened on the fine grasses and corn of Henry, and then selling at Louisville or Cincinnati on the hoof. The chief factory business is confined to wool-

en-mills, and grist and saw-mills, except that in some families the spinning wheel and hand-loom are still used by the good industrious ladies in the manufacture of home-made cloth. Large quantities of lumber and logs are annually shipped by the river and railroad to the cities, and some even to Europe.

TOWNS AND VILLAGES.

New Castle, the county seat, is situated in the southern part of the county, four miles from Eminence station, on the Louisville and Frankfort Railroad. It has good public buildings, a dozen mechanic shops, mills, a tannery, numerous handsome residences, and a population of about eight hundred persons.

Eminence is beautifully located on the railroad, has several fine churches, an academy, one of the best appointed fair grounds in the State, many beautiful private residences, and about five hundred inhabitants.

Fericho, *Smithfield*, and *Pleasureville*, on the Lexington branch, and *Pendleton*, *Sulphur*, *Campbellsburg*, and *Spring Hill*, on the Cincinnati branch of the railroad, and *Hendersonville*, *Port Royal*, *Franklinton*, *Springport*, *Bethlehem*, *Gistville*, and *Harper's Ferry*, back from the railroad, are all neat, thriving villages, each doing a considerable neighborhood trade.

Schools and Academies.—The Eminence College at Eminence is ably conducted by Prof. W. S. Gilter, with seven assistants; languages, mathematics, music, and all the English branches of literature, are taught. There is also a good, well-patronized academy at Eminence, and another at Smithfield. Prof. J. R. Brinker conducts an excellent academy at New Castle. Besides these, and several other private schools, are the free public schools, taught under the State common school system, in every district in the county.

Religious Denominations.—The Presbyterian, Reformer, Baptist, Methodist, Episcopalian, Catholic, and Universalist are the principal religious societies. The churches are usually fine buildings, and the congregations are generally large and very tolerant towards each other. There are several societies of Masons, Odd Fellows, Granges, Good Templars, &c., &c.

Social Characteristics.—The people of Henry are remarkably intelligent, thrifty, energetic, and hospitable, and are wide awake to keep up with the progress of the world as it advances. They are shrewd traders, good farmers, high liver, and social in their different neighborhoods.

A Grange picnic in Henry, as it is in almost every other county in Kentucky, is a feast suited for a king; and nowhere else can the females of the country be found who excel their sisters of Henry in the art *cuisine*, or in tasteful, neat dressing, without extravagance. This is a good county to move to, and a good people to live amongst.

HICKMAN COUNTY.

Hickman county was formed in 1821 from parts of Caldwell and Livingston, and named for Captain Paschal Hickman. It is bounded on the north by Ballard, east by Graves, south by the Tennessee State line and Fulton county, and west by the Mississippi river, which separates it from the State of Missouri.

Topography, Geology, and Soil.—This county is located in the extreme southwestern corner of the State, next to Fulton, the latter having been cut off from it. Like other counties of the State lying west of the Tennessee river, Hickman is located on the tertiary and quaternary formations. There are no minerals or rocks at the surface except a ferruginous sand concrete that is found more or less abundant throughout this region, but not in such compactness as to be valuable for building purposes, or in richness sufficient to pay for working the iron in it. The face of the country is level, or gently rolling, with but little fall in the water-courses. The soil is generally very rich and loamy, some of it being inclined to be too wet. It produces in great perfection corn, cotton, wheat, oats, rye, barley, flax, and tobacco, and the hilly parts make excellent orchards. The amount of sand in the loam makes it work very easy and free, and causes all classes of vegetation to grow rapidly. Lignite is found about the water level throughout the county, and a very fine sand ("chalk sand") suitable for the manufacture of a superior quality of glass-ware. At the "iron bank," near Columbus, iron ores (sand and iron conglomerate) in considerable quantities appear on the river bluff, in the form of a very compact sand rock, cemented with iron alumina and other metals, but probably of not much value for building or other purposes.

Timber.—This county was originally very heavily timbered, growing every variety indigenous to the northern temperate zone in America, except the pines and firs. The oaks, cypress, gum, poplar, pecan, hickory, holly, walnut, cherry, sugar-tree, box elder, maple, sassafras, cottonwood, and beech grow to immense size. The undergrowth consists of papaw, spicewood, witch-hazel, rattan cane, grape vines, and almost every other vine and rich-land shrub usually found on the Ohio and Mississippi river bottoms.

Railroads, River Transportation, and Streams.—The Mississippi, father of waters, washes the entire western border, and affords navigation to all parts of its great valley. The Little Obion runs entirely through the county, affording water sufficient for mills and factories. The Bayou de Chien is also a good mill stream. North Fork, Town Fork, Brush, and Barren creeks, are all suitable, during a part of the year, for good mill streams, and they give excellent drainage to the beech lands. The Mobile and Ohio and the New Orleans, St. Louis and Chicago, and the Paducah and Gulf Railroads pass entirely through the county, from north to south, the one beginning at Columbus, and another at a point opposite Cairo, and the last at Paducah. Thus every neighborhood is within five or six miles of the Mississippi river, or a first-class railway, connecting with every point in the Southern and Western States. No one county in the State has such unfailing facilities of travel and transportation, or has every square mile so conveniently located to river transportation and railroad depots.

Orchards and Crops.—The influence of the Mississippi river and the high rolling ridges of this county conspire to make it one of the best fruit-raising sections of the State, where apples, peaches, pears, plums, cherries, &c., &c., grow to perfection, and very rarely fail to produce a full crop. The smaller fruits, berries, and nuts, in their native wilds, meet the eye in every direction, and when domesticated flourish exceedingly. The pecan trees are more fruitful even than the hickory and walnut, and supply, for home consumption and export, quite a profitable business for the young people who gather them. The pea-nut or "goober" has been introduced since the war by some Tennessee immigrants, and has proved a good crop, more profitable even than corn or tobacco in some neighborhoods. Their cultivation is very simple, much like that of potatoes, and their yield is astonishing when the season is propitious. Corn, wheat, tobacco, and cotton are the chief staples, and to these the farmer looks mainly for his profits. From fifty to seventy-

five bushels per acre of corn have repeatedly been gathered on good lands, and from twelve to sixteen hundred pounds of tobacco, but the average crop is far below these figures. Proper chemical fertilizers, sown broadcast, would make the good-lying lands easily reach these figures. Timothy, herds-grass, orchard-grass, clover, millet, and Hungarian grass make fine meadows, and yield hay equal to that of any part of Ohio.

TOWNS AND VILLAGES.

Clinton, the county seat, is handsomely located near the centre of the county, on the New Orleans, St. Louis and Chicago Railroad, and contains a population of about five hundred. It has a good court-house, several churches and mechanic shops, and some very neat private residences.

Columbus is well located on the Mississippi river, at the crossing of the Mobile and Ohio Railroad. It contains about two thousand five hundred people, has numerous elegant stores, fine churches, steam grist and saw-mills, machine-shops, factories, and a score of mechanic shops. It also has well-taught academies (both male and female).

Moscow is a very flourishing town of over four hundred people, located on the Ohio and Mobile Railroad, about six miles from Clinton. It has several fine churches, tobacco factories, grist and saw-mills, an academy, and a dozen mechanic shops.

Baltimore, Obion, Oakville, and Wesley, are all neat, flourishing villages, with large local trade. The railroad depots at Columbus ship large quantities of cotton, tobacco, hogs, lumber, staves, fruits, poultry, and other country products.

Mills and Manufactories.—The extensive forests of fine timber, and the heavy yield of agricultural products, have called into existence quite a number of steam grist and saw-mills, planing-mills, wagon and carriage-shops, and other lesser manufactories. These are located at Columbus, and near the different depots along the railroads. They export largely of their several products, supplying the States of Tennessee, Alabama, and Mississippi, in part, with many things needed on the plantations. The flour is ground from home-raised wheat, and is of excellent quality.

Schools and Churches.—The State common school system has been inaugurated over the county, and public schools are taught in every district. There are several good private high schools taught in the county, and at Columbus and Clinton are excellent academies under the charge

of efficient teachers. The Methodist, Baptist, Catholic, Reformed Christian, Presbyterian, and Episcopalian are the chief denominations, but there are also some Unitarians and Universalists scattered through the country.

Live Stock and Bees.—Great improvement within the last few years has taken place in the breeds of horses, cattle, sheep, swine, and poultry. The old "scrub stock" of the country still tenaciously holds its position of antagonism to all encroachments, and contends for mastery against the better bloods. But the superiority of the full bloods for profit will, no doubt, finally turn the scale in their favor. When the country was new, the people found wild honey enough for home use in hollow trees of the forest, which proves the adaptability of the climate and herbage for bee-culture. In the future, no doubt, honey will become a prime article of traffic.

Domestic Arts.—The industrious country ladies of Hickman county still, to some extent, practice upon those good old instruments, the wheel and the hand-loom, and manufacture from native grown flax, cotton, and wool, many articles of every-day wear. They also produce in quantities for traffic, over and above home consumption, honey, beeswax, butter, eggs, feathers, poultry, dried fruit, home-knit socks, and other articles which are usually found in the country stores. The men on the farms usually devote themselves entirely to the culture of corn, cotton, wheat, hay, and tobacco, and very seldom interfere in the domestic manufactures of the household. The people are intelligent, hard-working, and thrifty, and are seldom heard to complain of "hard times" or want of whatever is needful for good living or comfort. Immigrants will find this an excellent country.

HOPKINS COUNTY.

In 1806 this county was cut off from a part of Henderson, and named in honor of Gen. Samuel Hopkins. It is bounded on the north by Webster and McLean, east by McLean and Muhlenburg, south by Christian and Caldwell, and west by Caldwell, Crittenden, and Webster counties.

Geology and Soil.—Hopkins county is based entirely upon the carboniferous or true coal-bearing series of rocks, and is noted for the large amount of coal and iron ore beds that outcrop throughout its territory. Twelve different strata of coal, varying from one foot to nine feet in thickness, are known to exist in many parts of the county, and iron ores such as usually accompany this formation are visible in every neighborhood. The Geological Surveys of Dr. Owen and Prof. Shaler fully explain the coal and mineral resources of this county in their reports, which will be found of great value to those interested. The soil is diversified, consisting of rich bottoms, rolling lands, mainly free-stone underlaid by yellow, red clay subsoil, and ridge or hill lands, much of which is thin and rocky. There are some bottom lands very flat, and need drainage in order to make them workable; but if properly tile-drained would no doubt prove very fertile. Corn, wheat, oats, rye, and tobacco grow well in all parts of the county, and fruit of all kinds finds here a most congenial soil and climate. There are numerous coal mines opened, and large quantities of coal are exported by way of Green river and the Henderson and Nashville Railroad. The iron ores have not been utilized to any extent (although they lie so contiguous to the coal beds) owing to the lack of capital and the want of skilled labor. Salt and mineral wells and springs are numerous, and of good quality.

TOWNS AND VILLAGES.

Madisonville, the county seat, is handsomely located on the Henderson and Nashville Railroad, thirty-nine miles from the former place. It contains a fine court-house and other public offices, several elegant churches, three large manufacturing flouring mills, saw-mills, woolen factory, two academies, a dozen mechanic shops, and many neat, well-built private residences. The population, of about fifteen hundred persons, are remarkably intelligent, refined, hospitable, and thrifty, and are anxious to have their town made, as nature intended it should be, a large manufacturing centre for that section of country.

Earlington, four miles south of Madisonville and the railroad, is a new town (the outgrowth of the coal mines), of about one thousand population. It is the shipping point of two or three extensively worked coal mines.

Ashbysburg is a shipping point on Green river, from which large quantities of tobacco and lumber are exported.

Nebo is a thriving village of one hundred and fifty inhabitants, ten miles northwest of the county seat. It contains several tobacco factories

and stores, and is the trading point for a large section of the richest part of the county. *Hanson, Morton's Gap, Nortonville, White Plains, Underwood, St. Charles, Charleston, Tradewater Station, Frostburg, Swanville, Chalkland, Gordonsville, and Elwood* are neat, thriving villages, each doing a good local trade.

Transportation.—Green river, which is navigable for steamboats, forms the northeast boundary; and Pond river, which is navigable for rafts and flat-boats, the eastern boundary of the county; the Evansville, Henderson, and Nashville Railroad runs centrally from north to south through the county, and the Elizabethtown and Paducah Railroad from east to west, through the southern part, thereby affording to every neighborhood quick and easy communication with all points north and south, for freight and passage. Since the building of the railroads, extensive coal mines have been opened and large amounts of coal shipped to Louisville by the Ohio river, and southward by the daily freight train. The lumber and stave business also has grown into large proportions, and car loads of logs and sawed lumber are continually shipped southward, either to the farmers on the "barren lands of Kentucky," or the towns in the Southern States.

Schools.—There are two well-conducted academies in Madisonville, and several good private schools in different parts of the county, besides the free public schools, taught under the State system, in every district. The people are anxious to have their children educated, and take a commendable pride in having them attend the schools, and receive all the instruction there imparted to them.

Churches.—The "Ironside Baptist," the Reformer, the Methodist, Free-will Baptist, Catholic, Presbyterian, Episcopalian, and Universalist are the principal religious denominations of Christians. The church houses, though not elegant, are generally well-built, commodious, and comfortable, and well adapted for the use of the people, who believe more in good works and an honest faith than in loud-sounding organs, high-salaried priests or preachers, and pompous sermons.

Agriculture.—Tobacco is here the *king* of crops, while corn, wheat, oats, rye, and hay are grown extensively by every farmer. Much of the fine tobacco which has given character to the Henderson market is grown in this county, and sold at Henderson. Corn never fails (and wheat and oats rarely) of making a fair or full crop; and, consequently, large numbers of hogs are annually fattened here for the Louisville and Evansville markets. Mules are raised extensively for the Southern

trade, and sheep are kept in quantities sufficient to supply mutton and wool for home consumption. Nowhere could this class of stock be made more profitable if the farmers could get rid of the worthless curs and other dogs which now invade every flock, regardless of ownership. A proper system of fertilization for the lands when exhausted or worn would make a wonderful improvement in farming in Hopkins county. The superphosphates, gypsum or land plaster, German kainit, the South Carolina marls, ashes, lime, and salt can all be applied to these lands with marked advantage.

The scrub breeds of nearly every class of live stock reign supreme, although a few energetic, public-spirited men have introduced the better bloods from the blue-grass counties of the State. The extensive forests produce heavy masts of acorns, hickory nuts, &c., upon which the hogs can subsist almost without care. This causes the farmers to hold on to the long-faced, razor-backed breeds "that can make a living for themselves." The same may be said of the cattle and sheep, which live in "the range." Within a few years, however, we expect to see these things changed, and then Hopkins will rank, as she should, an excellent stock county. Fruit of all kinds do well, and even peaches rarely ever fail of a full crop. Vineyards, as far as they have been tried, are a success, and the native varieties of vines, such as the Catawba, Ives Seedling, Concord, Hartford Prolific, &c., will yield here astonishingly fine crops, when well attended to and the land properly tile-drained.

Domestic Arts.—In many neighborhoods the energetic, industrious female portion of the population continue to use the cotton-cards, the flax-wheel, the spinning-wheel, and the hand-loom, and to manufacture at home jeans, linseys, cottonades, linens, counterpanes, towels, sheets, and various other articles for family use and traffic. They also trade largely to the country merchants poultry, eggs, feathers, beeswax, dried fruit, home-knit socks, maple sugar, tree molasses, and ginseng. The lords of creation seldom interfere in these smaller industries, but keep employed on the farm in raising the crops, attending the stock, and at the polls in regulating the politics of the country.

Social Characteristics.—The people of Hopkins county are remarkable for their intelligence, high-toned integrity, good morals, social natures, and great hospitality. They are mostly descendants of the original settlers from Virginia and North Carolina, and retain the social habits and hospitable characteristics of those States, even to the good, old fashion of taking the mint julep, or "peach and honey" before breakfast. They

have nothing of that selfish, aristocratic pride, which is too often met with in old countries or large cities ; but every man is judged alone by his industry, intelligence, and moral worth, and takes the position to which his development naturally gravitates.

JACKSON COUNTY.

This county, named in honor of Gen. Andrew Jackson, was organized in 1858, from parts of Madison, Estill, Clay, Laurel, and Rockcastle, and is bounded on the north by Estill, east by Lee, Owsley, and Clay, south by Clay and Laurel, and west by Laurel and Rockcastle counties.

Geology and Minerals.—Through the centre of this county, from east to west, is a ridge of high lands that divides the county, the one side being drained by the Rockcastle river and its tributaries into the Cumberland, and the other side by Station Camp and Sturgeon creek and their tributaries into the Kentucky river. The underlying rocks over more than three fourths of the county belong to the coal-bearing-series ; but the broad, open, and productive creek and river bottoms are nearly all cut through to the sub-carboniferous limestone formation. Ferruginous shale, immediately overlying the conglomerate sandstone, has entered largely into the formation of the soil, so that the sobby black beech lands are of frequent occurrence. In the northern part of the county, Rock Lick and War Fork creeks have cut entirely through the sub-carboniferous limestones, and present very broad fertile valleys in the upper members of the knobstone series. The conglomerate coal strata extend over nearly the entire county, while the upper coal measures outcrop on the highest hills and ridges. The amount of coal in this county is immense, and will some day be worked at fine profit. The iron ores are very extensive, nearly the same in kind as those of Estill and Rockcastle counties. Chalybeate, sulphur, and salt springs are numerous, coming, doubtless, from the shale formation above and below the sub-carboniferous limestones.

Timber.—The beech growth in Jackson is the finest in the State, besides which, there are immense forests of the best yellow and white pine, oak, ash, walnut, cherry, chestnut, gum, poplar, maple, sugar-tree, hornbeam, hickory, alder, locust, and all other kinds of hard and soft wood indigenous to this climate. The mountain laurels, and other flowering and berry or nut-bearing shrubs, are very numerous, and in the spring and summer months give to the hills and bluffs a most majestic and beautiful appearance.

Water-power and Streams.—Station creek, Middle Fork, South Fork, War Fork, Sturgeon, Pond, and Horse Lick creeks are all good mill streams, and afford many excellent sites, with plenty of fall, for factories, furnaces, and mills. Along these streams are many precipitous bluff banks, from which can be traced the various rocky formations through ledges or layers from the upper coal measures to the knobby sandstones in the bottom of some of the creeks. These bluffs are overhung with the beautiful flowering plants, which give them a very gay appearance. There are no streams sufficiently large to admit of slack-water navigation.

TOWNS AND VILLAGES.

The good, honest, intelligent citizens of Jackson love freedom of action too well to be crowded into the narrowed confines of a city or town; therefore we find them generally located, each family upon his own tract of land, near some excellent spring of fresh gushing water, inhabiting a house built with an eye more to use than ornament.

McKee, the only town, and the county seat, is handsomely located on a small creek flowing into the Middle Fork of Rockcastle river. It has a good court house, several fine churches, half a dozen mechanic shops, a mill, and some neat family residences.

Gray Hawk, *Green Hall*, *Middle Fork*, and *Morill* are neat villages, each doing a considerable traffic in the agricultural products, and the smaller industries of the country and in peltries.

Religious Denominations.—The Predestination Baptist, the Missionary Baptist, the Methodist, Reformer, and Universalist are the principal religious associations in the county, although some Presbyterians, Unitarians, Episcopalians, and Catholics are scattered through the county. The church buildings are generally of primitive architecture (log-houses covered with boards); but the seats are free, and the faithful members feel assured that as pure, heartfelt sentiments can emanate from these as from the most costly chapels of the world.

Schools.—The public free schools are taught in every district in the county, and the system is becoming better understood by parents, who are more anxious each year to get their children taught in the elementary branches of an English education. There is a good private school at McKee, where the higher branches are taught to those desirous of becoming more proficient scholars.

State of Society.—The people of Jackson are industrious and economical in their habits, and are rarely tempted to go in debt beyond their ability to pay. They are contented to live on what they make, and not to draw on imaginary or prospective crops, in order to shine in borrowed feathers. They have but few inmates in their jail, and a very slim docket for lawyers in their courts, there being only four or five of this occupation in the county; and they frequently threaten to leave, and go where the harvest is richer for their calling. The houses are not elegant, but an air of calm, rural independence surrounds them, suggestive of home pleasures and comfortable living. Everybody looks healthy and satisfied, and the State feels a pride in having such healthful nurseries from whence, in the future, is to come much of her choice population.

Crops and Vineyards.—Corn is now the chief farm product, although the soil is well adapted to wheat, oats, flax, tobacco, orchards, and vineyards; clover, timothy, herds grass, and millet do well, and make fine hay. Flax grows most luxuriantly, and could be made a leading and most profitable staple, especially if the farmers could introduce the flax-brake that cleans over 1,000 pounds of lint per day, at very small cost. Orchards and vineyards will do as well here as in any county in the State, and wine and brandy-making might be made as profitable as tobacco is in the Southern counties, or cotton in the Southern States.

Live Stock.—The old-fashioned scrub stock is the favorite, "because they can make their own living." But, within the last few years, some enterprising farmers are introducing better breeds of cattle, swine, and sheep, which will, no doubt, soon become common. Sheep husbandry would do well here. The soil, climate, vegetation, and grasses are all suited to producing the best class of wool-growing Cottswold, Leicester, or Shropshiredown sheep. Bees flourish well in Jackson, and the people find in the hollow trees and cliffs honey enough for home use. This industry, properly attended to, would become very profitable.

Domestic Arts.—Fruit-drying, butter-making, and poultry receive considerable attention from the female population. But they pride

themselves justly upon their skill in the use of the cards, loom, and spinning-wheel, and upon the fine samples they turn out of home-made jeans, linseys, linens, counterpanes, knit socks, blankets, and cottonades. The "quilting frolics" among the young people are greatly enjoyed, and are one of the highways through which Cupid and Hymen lead the unsuspecting youths into housekeeping on their own account. The table-lands are covered with forests of chestnuts, chinquapins, and whortleberries, the fruit of which is gathered for exportation, and is quite a valuable article of trade. Ginseng abounds on the slopes of the hills, and many persons find profitable employment in digging and marketing the roots. An industrious boy, armed with a "seng-hoe," can easily make a dollar a day. Maple sugar and molasses are articles of home production, which add much to the good things furnished by the frugal housewives. Feathers, wolf and fox scalps, and various kinds of furs and peltries, bring money into the country to supply the frugal wants of the people.

JEFFERSON COUNTY.

This was one of the three original counties into which the county of Kentucky was divided by the Virginia Legislature in the year 1780. It was named in honor of Thomas Jefferson, then Governor of Virginia, and embraced all the "territory south of the Kentucky river which lies west and north of a line beginning at the mouth of Big Benson creek, and running up its main ford to its head; thence south to the nearest waters of Hammond's creek, and down the same to its junction with the Town Fork of Salt river; thence south to Green river, and down the same to its junction with the Ohio." It has been trimmed and cut down until now it is bounded on the north by the county of Oldham and the Ohio river, which separates it from Indiana, east by Shelby, south by Spencer and Bullitt, and west by the Ohio river.

Geology and Soil.—The upper Silurian, the Devonian with the black Lingula shale, and the Waverly series, are all to be found in Jefferson

county. The middle and western parts of the county, particularly the portions watered by Beargrass and Pond creek, are very level, while the northern and eastern parts are rolling and slightly hilly. The lands known as "Beargrass lands" are exceedingly fertile, and under a very high state of cultivation. They are, however, based upon the magnesian and coralline limestones, which are not near so full of organic remains as are the blue limestones of Fayette and Woodford counties, nor so easily to disintegrate and give out fresh supplies of plant food. These lands, however, are susceptible of being highly fertilized by the application of stable manures and chemicals, and when so treated, they show a productiveness for all kinds of vegetables that is wonderful. If these lands were well supplied with tile-drainage, their value would be doubled, and they would require much less of fertilizers. There are no minerals of value to be found in this county, although the iron ores, which usually accompany the shale, are found to outcrop; but as there are but small areas of this formation in the county, the minerals are unimportant. Wells sunk in any part of the city of Louisville, or upon the flat or level lands until they reach the level of the Ohio river, will always have a full and copious supply of the best water. In parts of the county are found soils made from the mudstones of the Silurian rocks, which, like similar soils in Boone, Grant, and Kenton counties, are noted as "sobby beech." These lands, if tile-drained and fertilized, can be made exceedingly rich in plant food, and will become first-class garden soils. When broken or hilly they are fine for all kinds of fruit, but particularly for pears and the finest classes of cherries, such as the oxhearts, blackhearts, &c., &c. All parts of the county is susceptible of cultivation, and will produce excellent crops of corn, wheat, barley, flax, hay, tobacco, oats, and all kinds of vegetables and fruits.

Agriculture.—The old plantation system is fast giving way to the new order of things produced by the rapid growth of the city of Louisville and the emancipation of the former negro slaves. The large plantations have been, and are being now, cut up into small tracts, and converted into garden farms, and orchards of large and small fruits. The large wheat, corn, and tobacco fields have been changed into fields of potatoes, cabbage, turnips, and other vegetables, and grass meadows. Fruits of all kinds are greatly on the increase, while melons and grapes, in addition to the small berries, and the different classes of ornamental shrubbery and nurseries, are making specialties. Poultry-raising, honey-making, and dairying are attracting more attention than ever before, and

many persons look to these industries as the basis of their fortunes. Still there are some farmers who hold on to the old habits, and still eschew the idea of converting their plantations into the new system of garden-farming; these continue to cultivate exclusively under the old plan, and make corn, hay, oats, wheat, and tobacco. They also keep fine breeds of all kinds of live stock, with pedigrees equal to any found in Kentucky or the West. Some of the best Alderney, Jersey, and mixed Short-horn milch cows in the State are to be found in Jefferson, and the hogs raised here are equal to any that go into either the Louisville or Cincinnati markets. The hay and meadows of this county are first-class, and on much of the flat lands could be doubled in yield by a judicious system of tile-drainage. The fruit is excellent, particularly the peaches, pears, and cherries; the vineyards vary exceedingly, according to the situation and drainage. Good drainage (tile), with proper exposure on the eastern or southern sides of the hills or ridges, and good attention, will rarely fail to make a first-class vineyard, when vines are planted from stocks of the improved native varieties. The Concord seems to be the most certain bearer.

CITIES AND VILLAGES.

Louisville now contains about 160,000 persons, and is rapidly improving in wealth, population, manufactures, and commerce. *It is a solid city.* It is entirely owned at home, or nearly so, and not like Chicago and many other Northwestern cities, which are principally owned by capitalists of Boston, New York, or other outside places, to whom tribute is paid annually nearly equal to all profits. The citizens are principally of the Virginia and North Carolina stock, thoroughly intermixed with the German, Irish, Scotch, and other leading European races. The courthouse, the city hall, public schools, churches, theatres, library halls, medical and law colleges, marine, city, and charity hospitals, public halls, Masonic, Odd-Fellows, and other lodge buildings, and eleemosynary institutions are first-class, elegant specimens of architecture, and fully equal to similar buildings in any of the Western cities. The markets are unsurpassed by any in the United States in all kinds of meats, fruits, vegetables, canned goods, melons, fish, and game. Rents are low compared with other large cities, and workingmen can live here with their families as cheap, if not cheaper, than in any similar city on the continent, and certainly nowhere can his family have better health or better living. The health statistics, reported by the meeting of the National Medical Society, show Louisville to be by far the healthiest city of its size

in the United States. The water-power at the falls of the Ohio is much greater (when it shall be properly utilized) than that of any manufacturing metropolis in the world. Coal (both block and bituminous) can be delivered from the two Kentucky and the Indiana coal fields (not to mention the Pennsylvania and Ohio coal fields) as cheaply and of as good quality as can be found in the West. The banking facilities, the railroad and river navigation facilities, the school facilities, the manufacturing facilities, the mercantile facilities, the marketing facilities, and the gas-works and water supplies for the use of families, cannot be excelled by any place in any country. The law here reigns supreme, and order, justice, and good neighborhood are universally observed in every part of the city. To say all that we ought about this city in her praise, and in truth, would occupy too much space. (See "Cities and Towns," page 90; also pages 84, 85, and 86.)

There are several neat, thriving villages in Jefferson county, in many of which are large stores, superb residences, and fine schools, academies, and churches. The principal of these are *Worthington, O'Bannon's, Anchorage, Eden, Floyd's Creek, Taylor's Depot, Middletown, Jeffersontown, Fisherville, Fern Creek, Newburg, Fairmount, Old Deposit, Randolphs, Strawberry, Riverview, Orell, Valley Station, Laconia, Lockland, Ormsby's, and Lyndon.*

Schools and Colleges.—There are three first-class medical and one law college in Louisville. The public city free schools are equal to any in the United States, the high schools of which give thorough instruction in all branches of science, the languages, &c., &c. German, French, &c., are taught in all the common free schools of the city. The Masons, Baptists, Methodists, Presbyterians, and Catholics have each one or more orphan schools in Louisville. "The Masonic Home" is probably the best institution of its class in the United States. The city free public schools have attached to them several night schools. The number of children in the free city schools will number about 20,000, of which about 3,000 are colored children, who are taught in some eight to ten separate free colored schools, where the teachers are also colored. The German language is now taught to about 6,000 pupils each session. There are a large number of private high schools, "finishing schools," and other institutions in Louisville. Forest Academy at Anchorage is an excellent institution for the education of young men. It has military drill after the fashion at West Point. The cadets wear a very neat, handsome grey uniform. It is under management of Dr. McCown and

an able corps of professors and tutors. There are about one hundred students. At the same place is the Bellwood Female Seminary, an institution of excellent reputation, well patronized by the citizens of Jefferson and other counties, and located in a beautiful grove near the depot. The school buildings are well arranged and commodious. There are several other academies and high schools in the county, besides the free public schools of the State, which are taught in each district.

Churches.—In Louisville can be found numerous churches of every Christian sect known in the country, besides two large Jewish congregations, and one of the most costly synagogues in America. There are also a very large number of spiritualists, who usually have their weekly meetings and lectures, which are well attended by a very intelligent, respectable, and intellectual set of men and women. The church buildings in Louisville and throughout Jefferson county are very fine, and generally elegantly furnished. The congregations are large, intelligent, and earnest members of the different denominations to which they are attached. The clergy are mostly men of fine education, and accomplished orators, and fine debaters. The Sunday schools are attached to every church, and are attended by a very large number of children.

Manufactures and Statistics.—The tables taken from the Auditor's report will give much information regarding the different counties, including Jefferson. The names of the factories, their business, and capital employed, are too numerous to be here given in detail, as they would nearly fill a volume to do justice to those of Louisville alone. Suffice it to say, that in Louisville are factories of almost every kind that can be found in any city in the United States or Europe, with a limitless supply of the raw materials, and other things necessary to make first-class goods, wares, and implements. Tobacco factories, tanneries, shoe and boot factories, glass-ware, whisky, flour, carriage, buggy, and agricultural implement-making, and all sorts of iron furnaces, rolling-mills, cotton and woolen cloth, furniture, and edge tool factories, seem to be the most common.

Railroad Facilities and Commerce.—No place has a better system of railways, and better river navigation throughout the year. Already railways run north, south, east, and west, and several others are in contemplation of being built to further enlarge the area of the commerce of the cities around the falls of the Ohio. The Louisville and Nashville Railroad and its branches, under the able management of Dr. E. D. Standiford, has grown to be one of the largest and best conducted

thoroughfares in the United States, and adds greatly every year to the prosperity, wealth, and growth of Louisville. The same can be said of the Louisville, Cincinnati, and Lexington Railroad, and the Louisville and Southwestern Railway, which is the great coal feeder of the city. The roads running north of the Ohio river are also great feeders to the commerce and business of the city.

The State of Society.—No city in the United States presents a better state of society than the city of Louisville, and no county better than that of Jefferson, if we take into consideration general intelligence, honesty, and uprightness of dealing, high-toned morality, obedience to the laws of the land, and real inborn native hospitality. Refinement and elegance, too, are here almost indigenous, and equal to that found in any part of the world. The people know the great natural advantages which their city and county possess, by reason of locality and healthfulness, and feel that they can honestly and truthfully say to immigrants, from all points of Europe and the United States, "if you will come here, we will receive you with open arms, and rejoice to have you aid us in developing the resources of our great State, our city, and our county, which are not excelled in any part of the great Mississippi Valley."

JESSAMINE COUNTY.

Jessamine county was formed, in the year 1798, from a part of Fayette, and named for Jessamine creek, which was called for Miss Jessamine Douglass, who, in the early settlement of the country, was killed by the Indians, while sitting on a rock at the fountain head of this creek. It is bounded on the north by Fayette, on the east by Fayette and Madison, on the south by Madison and Garrard, and on the west by Woodford and Mercer counties.

Geology and Soil.—This county lies about the middle of the State, and is based entirely upon the upper Cambrian or lower Silurian rocks. All the northern half of the county is undulating, and very rich in its soil; the part from this to the Kentucky river is not so rich, owing to

the fact that it was formed from those strata of the Silurian rocks that are less marly and less fossiliferous. The portions along the Kentucky river are hilly and broken, but quite productive. Blue-grass grows everywhere in the county to perfection, and the best grades of the land produce excellent hemp. The poorer lands excel in wheat, small grain, and fruits of all kinds. There are in this county no coal or useful metal, except some slight traces of lead ores along the strata of the Kentucky river marble. The scenery along the Kentucky river in this county is among the finest in the Mississippi Valley.

Agriculture.—Hemp, corn, wheat, rye, oats, potatoes, flax, and tobacco are the staple crops, all of which grow to great perfection, except where the lands by bad usage have lost some of the original elements of plant food, so necessary for these crops, and which can be easily and cheaply restored by means of chemical or mineral fertilizers. The hemp and corn grown here are as good as similar crops in Fayette or Woodford counties, and the blue-grass pastures or meadows of other grass or hay crops will compare favorably with those of any part of the State. Fruit of all kinds mature well, and on the hills and ridges grapes of excellent flavor grow most luxuriantly. The smaller fruits, nuts, and berries, both cultivated and wild, are produced in abundance, while melons and all kinds of vegetables flourish as well here as in any other part of the State. The superior grass and corn grown in Jessamine make it necessarily one of the best stock counties in Central Kentucky. Here are found the best bloods of horses, cattle, sheep, hogs, and poultry. The old-fashioned scrub stock of every class has long since been banished, and now only the best pedigrees are kept by the intelligent, thriving farmers. Fine racers and trotters are fashionable breeds of horses; the Short-horns and Alderney in cattle are the favorites, as are also the red and black Berkshire, Chester White, Essex, and Woburn in swine, and the Merino, Cottswold, Shropshiredown, and Southdown in sheep.

TOWNS AND VILLAGES.

Nicholasville, the county seat, is handsomely situated about the centre of the county, on the Kentucky Central Railroad, which connects it directly with Lexington and all parts of the country. It has a fine court-house and other public offices, some eight or ten churches, two academies, saw and grist-mill, rope and bagging factory, a dozen mechanic shops, and many elegant private residences. The population is nearly 1,500, and steadily growing.

Keene has a population of 300 to 400 inhabitants, and is a place of considerable importance.

Spears, Providence, Catnip Hill, Hilldale, Pekin, Hanley, and Little Hickman are all neat, thriving villages, each doing a good local trade in rich neighborhoods.

Transportation Facilities.—The Kentucky river (navigable for steam-boats) forms the southern boundary of this county, and the Cincinnati Southern Railroad, coincident with the Kentucky Central, runs centrally through this county, affording daily connection both north and south. The northern part of the county is also not very far distant from the Louisville and Lexington and the Lexington and Big Sandy Railroads, which pass through Fayette county.

Churches.—The principal denominations are the Catholic, the Presbyterian, Methodist, Baptist, Reformer, and some Universalists. The church buildings are generally of elegant structure, and finely finished, and are located in every neighborhood, so that no one has to go very far to worship.

Schools.—At Nicholasville are two excellent academies and two private schools. At Keene is also a good seminary, well patronized by the people of the neighborhood and county. The State free common schools are taught in every district, and the people take great pride in having every advantage given their children by which they may become well educated.

The Lesser Industries.—The people of Jessamine, owing to their rich lands and fine breeds of live stock, have become too rich any longer to manufacture home-made cloth on the old-fashioned hand-loom; but they find it more profitable to raise fine stock for market, and to buy clothing made at regular factories elsewhere. They, however, furnish quite a large amount of poultry, eggs, beeswax, feathers, maple sugar, tree molasses, and dried fruit to the markets of Lexington and the adjacent cities and towns.

State of Society.—Industrious, intelligent, and economical in their habits, the people of Jessamine have become rich, and are rarely tempted to trade beyond their ability to pay. They are contented to live on what they make, and not to draw on imaginative crops, in order to shine in borrowed apparel. No county in the State has a more law-abiding community. The civil dockets are so small that the lawyers are compelled to resort to other avocations to supplement their scanty fees. The poor-house, if there is one needed, is rarely tenanted, and the jail has almost gone to decay for want of use.

Future Prospects.—The growth of cities, and the increase of transportation facilities, will necessarily cause the larger plantations to be cut up and used in garden-farming, or else to be used more exclusively for stock; and also cause more orchards and vineyards to be planted, thus affording facilities for the employment of a much larger population than that now residing within the territory. The wealth, too, will be increased relatively by means of fertilizers and a superior system of cultivation, which will follow as a necessary consequence of this new order of things.

JOHNSON COUNTY.

In 1843 this county was formed from parts of Floyd, Lawrence, and Morgan, and named in honor of Col. Richard M. Johnson, and is bounded north by Lawrence, east by Lawrence and Martin, south by Floyd, and west by Magoffin and Lawrence counties.

Topography, Geology, and Soil.—Situated in the extreme eastern part of the State, Johnson county embraces some of the best coal and iron lands in the West. The Appalachian range of mountains passes along the eastern border of Kentucky, and the elevated lands of all that section of the State is caused by their upheaval. The carboniferous rocks underlie the entire county, and the coal strata outcrop on all the rivers, creeks, and ravines. The general face of the country is hilly, and in some parts mountainous, with many rich, fertile, broad valleys. The tops of the ridges, though thin and sandy, are covered with thick forests of pine, hemlock, fir, oak, chestnut, and other wood suitable for timber. The iron ores, similar to those of Carter, Boyd, and Lawrence counties, can be found in every neighborhood. These ores belong to the family of limonites or hydrated oxides and proto-carbonates of iron. Many beds are quite rich, capable of yielding from 50 to 70 per cent. of metallic iron; others will not yield over 20 to 30 per cent. They are usually found in connection with the shale beds, though frequently resting on or near to the mountain limestone of the sub-carbon-

iferous period. The coal is found in the usual coal measures; also the sub-conglomerate beds exist, but not in strata so thick as they are in Pulaski and Bell counties. The amount of coal, however, in the regular measures is immense, and will, no doubt, be utilized (in the future) to smelt the iron ores lying contiguous to them. The soil in the bottoms and valleys is very rich, but thin and sandy along the ridges. Chalybeate, sulphur, salt, and oil springs abound.

Streams and Water-power.—The West Fork of Big Sandy river runs from south to north through the centre of Johnson county, and with its tributaries drains the entire country. This stream could be made navigable the entire year by slack-water. As it is, steamboats, during the winter and spring months, can navigate it for a considerable distance. The numerous short creeks which take their rise in the Kentucky ridge and Boone ridge have great fall before they empty into the West or South Fork, and therefore afford many good mill-sites, where short dams can easily control the water.

Trees and Grasses.—Very few counties in the State are more abundantly supplied with timber. Dense forests of pine, which have scarcely been touched, white oak, black oak, chestnut, hemlock, poplar, and chestnut oak prevail. The tan-bark of the chestnut oak is largely used in various tanneries, and exported down the Big Sandy. It has been found better even than hemlock for tanning purposes, and makes leather worth ten per cent. more. Rank wild grass covers the flat lands, and affords excellent grazing for sheep and cattle. Herds-grass, timothy, clover, and orchard-grass make first-class meadows, and supply food for all kinds of stock for more than eight months in the year. The bitter shrubs, so highly prized by sheep, grow in abundance, and indicate the great adaptability of the country to sheep-raising.

Productions.—The field crops at present cultivated are corn, wheat, oats, and small fields of flax and tobacco. In the garden are cultivated potatoes, turnips, cabbages, beets, sweet potatoes, tomatoes, squashes, melons, gourds, &c. Apples, peaches, pears, cherries, plums, grapes, and small fruits and berries, are all easily grown, and very productive. As a general rule, the farmers and their boys do all the field labor, and leave the house-work and domestic arts to the care and management of the women. A very small proportion of the lands have been brought under cultivation. Even in ante-bellum times there were but few negroes in this county, and hired help was seldom employed. Fruit growing and vineyards, if the facilities for transportation were better, could

be made more profitable than any other branches of farming. All varieties grow so perfectly, and fail so seldom, that a full crop could be depended on with the same certainty that a Southern planter expects a return from his cotton. Ten thousand pounds per acre can be easily raised, possibly of almost any variety, of native grapes, which have been improved by domestication. From these, 700 to 800 gallons of wine can be made, and brandy proportionally. Flax is well-suited for the lands, and will become in the future, no doubt, a leading staple, paying well both by its lint and seed. The wild pea-vine still grows vigorously, and affords the best and most nourishing food for cattle, sheep, wild turkeys, and other game.

TOWNS AND VILLAGES.

Paintsville, handsomely located on Paint creek, about the centre of the county, has over three hundred population. It contains a good court-house, an academy, several neat churches, a steam mill, half a dozen mechanic shops, and some good comfortable private residences. *Eastpoint*, *Hoodsfork*, and *Oil Springs* are flourishing villages, with large local trades.

Religion.—The Predestination Baptists are numerous in this county. The other principal denominations are the Methodist, Baptist (Free-will), Reformer, and some few Presbyterians, Catholics, Universalists, and Episcopalians. The church buildings are of primitive structure, made rather for use than looks. Every neighborhood has one or more of these churches, in which frequently different denominations worship on alternate Sabbaths.

Education.—The common schools are taught in all the districts in the county, and the people are each year becoming more imbued with the idea of educating their children. In Paintsville is a flourishing academy, under the control of an able superintendent, at which the languages and higher branches of a liberal education are taught.

Domestic Arts.—The women of Johnson county are remarkably intelligent and industrious. They do nearly all the manufacturing of the county, and make large quantities of jeans, linseys, cottonades, linens, counterpanes, home-knit socks, blankets, flannels, and kerseys for home consumption and traffic. They also traffic extensively in eggs, butter, poultry, beeswax, honey, feathers, ginseng, and maple sugar and molasses. The "fairer portion" also combine the useful with the agreeable by inviting each other to social "quiltings" and "apple-cuttings." They also manage the economy of the household with great skill, and

many a family whose table is spread with delicious food, and whose home is comfortable and cheerful, spends less than fifty dollars a year at the towns for all supplies. A barrel of salt, a keg of sugar, a few bales of spun cotton, and coffee is the extent of their purchases. The wife and daughters do their own spinning and weaving, make up the clothes with a needle (some sewing-machines are being introduced), and cook such dainty meals as would shame the keepers of many noted hotels. These are the right kind of women, and they are to be found everywhere in the mountain counties. No wonder the population increases fast and grows rapidly, and that so many distinguished men originate in these counties.

Live Stock and Game.—The razor-back hog is still a favorite, and no objection is made to his elongated face that can burrow deep for the sweet-brier roots, or search among the leaves for the hidden mast. The scrub cattle, too, and native sheep, hold sway, because they can make their own living; but these things will change when the men learn to manage the farms as well as the women do the domestic affairs of the house. Game and fish are plenty, and it is rare that a Johnsonite can be found who will not put off work during a push in plowing season in order to enjoy the sport of a first-class hunt or fishing frolic; and when they return, it is seldom that victory has failed to exhibit her reward in either the scalps or a fine line of fish.

KENTON COUNTY.

This county was taken in 1840 from a part of Campbell, and named in honor of Simon Kenton, one of the most noted of the Kentucky pioneers and Indian fighters. It is one of the smallest counties in the State in area, but among the first in population, wealth, and political importance. It is bounded on the north by the Ohio river, which separates it from Hamilton county, Ohio, on the east by Campbell, south by Pendleton and Grant, and west by Boone county.

Geology and Soil.—The upper Cambrian or lower Silurian rocks form the basis of Kenton county. In the strata that outcrop are some of

the best and richest in fossils and plant food to be found in the Silurian group. Along the Covington and Lexington Turnpike are very superior lands, as are also the river bottoms and nearly all the level parts of the county. Where the mudstone has been the principal formative rock, the soil is inclined to be too wet, and partakes of the nature of the "sobby beech lands" found in Boone, Pendleton, and the adjacent counties. These can be greatly improved by thorough tile-underdrainage (see drainage) and fertilization with lime and other chemical manures. There are no minerals of consequence in this county, although some lead and shot-iron ores may exist in small quantities, deposited, no doubt, by aqueous action. The mineral springs and wells ought to be of excellent water, as the calciferous sandstone underlies the Silurian limestone in every part of the county; and this is the bed of all such waters as the "Blue Lick" of Nicholas county. Wells dug in any place will, at a certain depth, strike these waters, which usually will arise by artesian pressure.

Agriculture.—Garden-farming has become the employment of nearly all the farmers in Kenton; vineyards and orchards, too, are very common, and generally do well; corn, wheat, barley, oats, blue-grass, and all sorts of meadow grasses grow to perfection, and vegetables of all kinds succeed finely. Every variety of garden produce and small berries, fruits, nuts, and melons are raised in large quantities for the markets of Covington, Newport, and Cincinnati. The great luxuriance of the blue grass makes the dairy business particularly profitable, as well as the rearing, for the daily markets, of lambs, pigs, calves, and poultry of all kinds, together with eggs, pigeons, and cut meats.

CITIES AND TOWNS.

Covington, a city of over 30,000 inhabitants, is located immediately opposite Cincinnati, Ohio. It has generally been considered a suburb of Cincinnati; but the great number of manufactories, the wealth and population, which are annually accumulating at this point, are fast changing it from a suburban town into a competing metropolis. It is built on a beautiful plateau, several miles in extent, with an adjacent territory of well located, rich, healthy lands, sufficient for the demands of a city of the largest class. The increase of population is progressing so rapidly that it has now become apparent to every person (who has noticed the growth of cities within the last five hundred years), that time only is wanting to place the combined cities of Covington, Newport, and other adjoining towns, ahead of even Cincinnati herself in

population, wealth, manufactures, and commerce. And this is really as it should be, when we look at the superior advantages of the extent of land, position, and water facilities possessed by the Kentucky side of the river. Nature designed the mouth of the Licking river as a spot suited for a great city, and the normal position is evidently on the two sides of Licking, and not on the opposite shore of the Ohio river, where a small valley is hemmed in by large bluffs and frowning hills. The growth of Cincinnati was abnormal and accidental; and though she has become a very large and beautiful city, yet natural laws cannot always yield without the proper reaction. This reaction is slowly, but surely, bringing up the cities on the Kentucky shore, and will continue until the violation of law is rectified and the metropolitan centre gravitates to its proper point upon the Covington and Newport areas. (See cities and towns and Campbell county.)

In Covington are to be found every class of business properly belonging to a city of its size, besides factories of different kinds in advance of its population, but worked by capitalists of Cincinnati, who well understand the superior benefits of the Covington locality. It has a very fine court-house, city hall, and other public offices, splendid churches, fine schools and academies, factories of all kinds, Masonic, Odd Fellow, and other charitable society halls and eleemosynary institutions, railroad and other machine-shops, and numerous elegant private residences. Her public schools are unsurpassed, and betoken thrift and future greatness. Our space will not permit an extended notice of all the advantages possessed by Covington, and the many inducements she holds out, through her naturally advantageous position, to immigrants and capitalists seeking homes or investments. Adjoining Covington, which will become eventually a part of the same corporation, are *West Covington*, with a population of about 2,000; *South Covington*, with 500 inhabitants; *Ludlow*, with a population of probably 1,500, and *Bromley*, with 250 inhabitants. The county also contains several flourishing villages, the principal among which are *Sanfordtown*, *Scott*, *Grant*, *Ryland*, *Mullins*, *Morningview*, *Demossville*, *Visalia*, *Independence*, *St. Johns*, *Staffordsburg*, and *Fishburg*. The town of Independence is the original county seat, and still a part of the county business is done at this point, but the greater portion at Covington.

Railroads and Navigation.—There concentrates at Covington the Louisville, Cincinnati, and Lexington Short-line Railroad, the Kentucky Central, and the Cincinnati Southern Roads. The Licking river

was once partially fitted with locks and dams, so as to give slack-water navigation, but the works were abandoned before being completed. The Ohio affords the best navigation of any river in the West, except possibly the Mississippi. Covington, through her connection, by finest bridges, with Cincinnati and Newport, shares equally with these cities all their railroad facilities.

Schools and Churches.—The city public schools of Covington consist of a high school and the usual primary departments, under the control of a principal, with about sixty assistants. Every department is in good working order, and no city can boast of a better system for the education of all the children in the city. There are also several excellent academies, both male and female, and private schools, whereat special branches are taught. The free public school system of the State has been inaugurated in every district, and every neighborhood is now provided with competent teachers. The church buildings are generally very fine, particularly in the city of Covington, and every Christian denomination is represented. The Spiritualists and Jews also have large representation at the Jewish synagogue and at the weekly meetings usually held by those who believe in spirit communications. This latter sect (if it can be called a religious sect) is composed of men and women from every grade of society, among them many men of large learning, intelligence, and scientific acquirements. The church members are generally very sincere and devoted to their views, and quite intelligent and well instructed upon all subjects, which go to make up an intellectual community. The clergy are remarkably well educated, and generally fine speakers and logicians. To each church is attached a Sunday School, in which the children are taught the peculiar tenets and catechisms of the particular church from which they receive instruction. The Sunday Schools are well attended, and the views here inculcated usually last through life.

Social Characteristics.—No county in the State is more thoroughly mixed in the various nationalities of her citizens than Kenton. Here we find harmoniously blended the Virginian, the North Carolinian, the native Kentuckian, the German, the Swede, the Frenchman, the Jew, the Englishman, the Scotchman, and the big-souled Hibernian. The proximity of Cincinnati, with its mixed population, has given tone to the population in several counties lying adjacent to her in Kentucky; and the same energy, thrift, and industry that distinguish the people of Ohio also overlap upon the population of these counties. The innate

Kentucky stamp of character, also, has made its impression for hardihood and social sympathy and pride of nativity; these elements all combined give forth a race of men and women not easily excelled in any country, and equaled by but few in any land. The characteristics are still on the increase, and will become more marked as the population advances, and a further subdivision of industries take place. Their effect will be to give us a most excellent community, and one that will make this part of Kentucky a *garden spot* upon our borders, and will draw to it a large portion of the wealth and influence of the Ohio Valley. Immigration from abroad will settle here—in fact, is now fast settling here—and will make this part of our State rank exceedingly high in the future prosperity of the good old Commonwealth.

KNOX COUNTY.

This county was organized in 1799 out of a part of Lincoln county, and named in honor of General Henry Knox. It is bounded on the north by Laurel and Clay, east by Bell, south by Bell and Whitley, and west by Whitley and Laurel counties.

Geology, Topography, and Soil.—Knox county is located in the southeastern part of the State, immediately adjacent to several of the most noted mountain ranges in Kentucky. The great *fault* which passes between the Pine Mountains and the Kentucky ridge touches the corner of this county, or so very near it as to influence materially the horizontal position of the strata of the coal measures, which prevail throughout this section of the country. A distinguishing characteristic of the geology of this region, which is coextensive with several adjacent counties, is the immense amount of coal and iron ores that are everywhere to be found, and the thick beds of sub-conglomerate coal lying beneath the mill stone grit. The proto-carbonate of iron, which, from its great richness and bright appearance, has been taken by the inexperienced for silver ore, exists in large quantities. The limonites and hydrated oxides of iron are found everywhere in connection with the beds of shale, and near the mountain limestone formation of the sub-carboniferous

deposits. Many beds of these ores are very rich, so much so that the smelting is improved by an admixture of inferior ores. The coals are cannel, semi-cannel, and bituminous, in beds varying in thickness from one to seven feet. Besides iron, some incidental minerals in small quantities are found disseminated irregularly through the proto-carbonates of iron, such as the sulphurets of zinc, lead, arsenic, antimony, &c., &c. But none of these are probably in quantities sufficient for profitable working. The stories of veins of silver, gold, and copper having been found in this and the neighboring counties, originated in all probability with speculators, who may possibly have "baited" some spot, whence specimens were to be taken and analyzed. No Plutonic rocks are found nearer the mountain ranges of northeast Kentucky than the Unaka Mountains in Tennessee (which are east of the main Cumberland range), and no metalliferous leads or veins have been discovered except in connection with granitic or igneous rocks. This county abounds in excellent sandstones, suitable for mill-grit, and grindstones, or building materials, and has also an unlimited amount of good building limestone quarries, but no granite. The soil along the river and creek bottoms, and the north sides of the hills, is rich, and produces large crops of corn, wheat, flax, and tobacco, but the ridges and south sides of the mountains are thin, rocky, or sandy and poor. The soil derived from the coal measures of the eastern coal field cannot, in the true sense, be regarded as unproductive, yet the limited amount of level arable land must necessarily restrict the agricultural pursuits of the people, hence the development of the immense mineral wealth of the country becomes a matter of the first importance to them. These resources, when fully developed, will no doubt compare most favorably with those of any civilized country at present known on the face of the earth.

Streams and Water-power.—Cumberland river runs through this county from east to west, and with its tributaries drains every part of it. Above the falls this river is not navigable, although it is a very large stream; yet the water-power afforded by the Cumberland and its tributaries, all of which have fine fall within this county, is sufficient to run an immense amount of machinery, either for factories, furnaces, forges, or mills. The principal of these tributaries are Lynn Camp, West Fork, Big Poplar, Richland, Greasy, Big String, Bush, Smoky Fork, Flatlick, Sinking, Indian, and Turkey creeks. From the north of the Collins Fork the streams run north into the waters of the Kentucky river.

Timber and Mills.—There are few counties in the State better supplied with all kinds of timber than Knox. Extensive forests of pine,

hemlock, spruce, poplar, chestnut, oaks, holly, walnut, cherry, and other valuable trees, are almost untouched, and in ample supply to last several generations. There are numerous water grist and saw-mills, which supply fully the home demand, but want of transportation prevents extensive exports.

Crops, Orchards, and Vineyards.—Corn, wheat, oats, and tobacco are the chief crops now grown. The amount of land devoted to grass is limited to small meadows and an occasional field of clover or millet. Herds-grass, timothy, and orchard-grass flourish well, and yield large crops of hay, particularly upon the beech lands. The wheat crop is on the increase, and would be more extensively sown if the markets were more accessible. Tobacco is grown only to a limited extent for the same reason. Potatoes, turnips, cabbages, and all kinds of garden vegetables, give excellent yields. Apples, peaches, pears, cherries, plums, and all the varieties of smaller fruits, berries, and nuts, scarcely ever fail of a full crop. Nowhere in the State can be found better lands for orchards and vineyards, and no crops could be raised that would bring greater revenue to the farmers if properly attended to.

Live Stock and Sheep Husbandry.—For the rearing of live stock Knox county possesses unusual advantages, and such as would insure, if properly applied, certain and liberal returns. The “range” of the mountains and ridges furnish ample pasturage for more than half of the year, and many of the rich hill-sides produce blue-grass and orchard-grass almost equal to the “Blue Grass Region.” Corn and fodder are chiefly relied on for winter food, but this might be replaced chiefly by an increase of the hay crop. Good barns and stables to shelter stock in winter would also add much to their comfort, as compared with the out-doors fare now common in the winter season among unthinking farmers. The herbs and native grasses are well suited to sheep husbandry, and thousands of acres, now lying in useless waste, could be utilized by the shepherd with choice flocks of the best wool-growing breeds of sheep.

TOWNS AND VILLAGES.

Barbourville, the county seat, is handsomely located on the north bank of Cumberland river, and contains about 550 persons. It has a fine court-house, an academy, several churches, half a dozen mechanic-shops, a steam mill, and many neat private residences.

Brafford's Store, *Bryant's Store*, *Flat Lick*, *Indian Creek*, *Lynn Camp*, and *Swan Pond* are all thriving villages with good local trade.

Education and Religion.—In every district in the county a public school, under the State system, is taught, and the people are taking more interest than formerly in having their children properly instructed. A good academy, whereat the higher branches of the sciences, arts, and languages are taught, is located at Barbourville, under the charge of proficient instructors. The principal religious denominations are the Old School (Hard-shell) Baptist, the Missionary Baptist, the Reformer, the Methodist, the Presbyterian, and Episcopalian. With houses made for use and not for show, these intelligent and faithful people are content to meet together more in the spirit of brotherly love than for the exhibition of pride when they come to church.

Domestic Arts.—The whistle of the locomotive has not yet been heard reverberating through the valleys of Knox; but what makes far better music is the hum of the spinning-wheel, the click of the cotton-cards, and the echo from the strokes of the hand-loom, each plied with the busy hands of the fairer portion of the population, who manufacture from the cotton and flax patch and native wool the best quality of jeans, linseys, cottonades, linen, socks, counterpanes, and blankets, enough for home use, and some to sell each year. They also produce for traffic large quantities of feathers, poultry, eggs, butter, beeswax, ginseng, maple sugar, and tree molasses.

Game and Fish.—Knox county is famous for game and fish. The deer, bear, fox, wild turkey, raccoon, opossum, and other smaller game, are found in great abundance, while the mountain streams are literally filled with bass, perch, trout, jack, suckers, campbellites, red-horse, stone-toters, hog fish, and other varieties. The amusement of hunting and fishing is greatly enjoyed by the natives, as well as by people from a distance, who visit the county on purpose for sport.

LARUE COUNTY.

In 1843 this county was cut off from the southeastern part of Hardin, and named in honor of John Larue. It is bounded on the north by Hardin, Nelson, and Marion, east by Nelson, Marion, and Taylor, south by Taylor, Green, and Hart, and west by Hardin county.

Geology, Soil, and General Appearance.—The surface of this county is quite varied—some level, some rolling, and other parts very hilly. The noted Muldraugh's Hill passes through from northwest to southeast, a little north of the centre of the county. The basis rocks are mostly of the sub-carboniferous limestones and Waverly group, but on the north and east are found the top layers of the upper Silurian, the Devonian shales, and knobby shales and sandstones. On the caps of the Muldraugh's ridge are many quartz pebbles, evidently the debris of the former conglomerate sandstones long since dissolved and washed away. Along with the lingula shale and gray shales are found the usual accompanying iron ores, and the bitter and mineral waters. The soil varies with the rocks from which it was derived. Wherever the sub-clay is deep red or chocolate color the lands are rich, and produce excellent wheat, corn, oats, and tobacco; but where the soil is based on a light yellow or whitish clay, it is inclined to hold water too long, and become sour and unproductive. These latter lands can be greatly improved by the addition of lime or land plaster (gypsum), German kainit, ashes, and bone-dust. Where the Devonian shale outcrops, north of the Muldraugh's ridge, there are numerous beech groves, pignut hickory, sumach, and chestnut oaks, which indicate the need of thorough tile-drainage, lime, ashes, &c., &c. In no country, probably, would chemical fertilizers show more marked results than in this county. The iron ores have not as yet been found sufficiently plenty to warrant the expense of building furnaces, though it is not at all impossible for good rich paying beds to be discovered in the future.

Crops and Live Stock.—Corn, wheat, oats, and tobacco have been the chief market crops. The tobacco is (much of it) of very fine texture, and ranks high for its qualities as a manufacturing leaf. The corn crops are generally fed to hogs fattened for the Louisville market. Stock of all kinds do well, and the breeds are rapidly improving by importations from the blue-grass counties. The amount of sweet and

bitter mast is usually enough to keep the hogs in good order until a few weeks before they are driven to market, when they are confined and fed on corn. Sheep are very healthy, and the long-wool breeds do as well here as in any part of the State. The Cottswold is the favorite for wool, and the Southdown for mutton. As yet the farmers do not pay much attention to breeding fine racing and trotting horses, but turn their attention more to mules, large numbers of which are annually sent to the markets of the Cotton States. Muldraugh's Hill is peculiarly adapted for orchards and vineyards. Peaches, apples, pears, quinces, plums, damsons, and cherries seldom fail of a full crop, and, so far as grapes of the native varieties have been tried, they have succeeded well. The berries are large, juicy, and faultless, and the wine has a large amount of saccharine matter, with a rich, elegant bouquet. This and the adjacent counties will doubtless become very famous in the future for their fine wines, grapes, and fruits.

Streams and Timber.—The beech, poplar, hickory, ash, walnut, gum, &c., are plenty for home use, and much to spare for export. The people have destroyed, by log-rollings and fire, enough trees, if they were now in the city markets, to pay for their lands; and although not quite so bad now as formerly, yet the practice of this wanton waste still goes on, and probably will until the great value of the trees become more apparent to the land-owners. The principal rivers are Nolin, Rolling Fork, North and South Forks, Otter creek, and Upton's creek, all of which are fine mill streams. There is no navigable stream in the county; but the Louisville and Nashville Railroad passes along the western, and the Lebanon Branch Railroad along the northern border of the county.

TOWNS AND VILLAGES.

Hodgenville, the county seat, is handsomely located on the south bank of Nolin, in the western part of the county, and contains a population of five hundred persons. It has a good court-house, several costly churches, an academy or seminary, carriage and wagon factory, tan-yard, a dozen mechanic shops, and several neat and comfortable private residences. *Buffalo*, *Magnolia*, and *Mount Sherman* are pleasant, thriving villages, with fine schools and large local trade.

Schools and Churches.—The free common school system of the State has been fully inaugurated in every district, and the people take great interest in having their children properly instructed. At Hodgenville is a seminary, under the charge of Profs. Fullilove and Hays, at which all

the higher branches of a liberal education are taught in a most thorough manner. The Buffalo Institute, under the charge of Prof. John W. Bradly, is an excellent institution, well patronized by the citizens of Larue and the adjoining counties. The Catholic, the Presbyterian, the Baptist, Reformer, and the Methodist are the chief religious denominations. Churches are thickly scattered over the country, so that no families have to go further than a few miles to public worship. The people are kind, industrious, and hospitable, and immigrants seeking homes will nowhere find better welcome or a more refined and intelligent community.

Smaller Industries.—The people still manufacture at home a large proportion of their every-day wear. From the native flax, cotton, and wool, the female members of the family spin and weave linseys, jeans, linens, cottonades, blankets, counterpanes, and other necessary cloths. These they make up at home in the old way with the needle, except where a family has a sewing-machine. These latter are becoming quite common of late years. Dried fruit, eggs, butter, poultry of all kinds, feathers, ginseng, and tan-bark are exported to the Louisville market by the neighboring railroads, and their sale brings into the country a large revenue. In the late winter months maple sugar and molasses are manufactured both for home use and traffic. Potatoes, apples, peaches, pears, blackberries, strawberries, cherries, plums, damsons, and persimmons are also sold in quantities to the hucksters, who trade at the different depots along the line of the two adjacent railroads. Many new orchards and small vineyards have been set within the last few years, which will add greatly to farmers' profits when the trees and vines get a little older. A peculiarity of Muldraugh's Hill is, that while fruit on the level rich lands is frequently killed by the frost, here it is never injured, and still the hill fruit will come soonest into the market.

Small Farms.—Since the war the farms are being subdivided, and, owing to the scarcity of labor, the old planting system has given way to smaller farms. The beneficial effect of this is clearly perceptible where the owners cultivate their own lands. There is visible an air of thrift and improvement about the farms, and more neatness, comfort, and taste about the houses. The want of taste and comfort about the dwelling comes more from habit than lack of means. One handsome, well-improved place in a neighborhood, stimulates other neighbors to do the same. This gives beauty to the country houses, and satisfaction to the families of the entire community.

LAUREL COUNTY.

In 1825 this county was formed out of parts of Clay, Knox, Rockcastle, and Whitley, and took its name from Laurel river. It is bounded north by Rockcastle and Jackson, east by Clay and Knox, south by Knox and Whitley, and west by Pulaski and Rockcastle counties.

Geology and General Characteristics.—The general base of this county is carboniferous; but most of the streams have cut through the coal measures to the cavernous limestone formation. The face of the country is high and rolling, and the hills and ridges in many places will pass for low mountains. Coal and iron exist in large quantities, very similar to the beds in Knox county. The limonite ores and hydrated oxides of iron appear in quantities above the limestone series, and also in connection with the shale beds. The sub-conglomerate coal, as well as the beds in the upper coal measures, are sufficiently thick to be worked with profit, and their contiguity to the iron ores will, at no distant day in the future, make them very valuable. The soil is quite diversified; the bottoms and north hill-sides are rich, while the south hill-sides and ridges are thin, and often rocky, poor, and sandy. The bluffs are numerous, owing to the great thickness of the conglomerate and mill-stone grit, which frown and beetle over the streams, always fringed with the most beautiful blooming laurels, which gave name to the river and the county.

Streams and Water-power.—The Laurel river and its tributaries on the south, and the Rockcastle and its tributaries on the west and north, thoroughly drain the entire county, and afford some of the finest sites for mills, factories, or furnaces to be found in the State, with water-power sufficient (owing to the great fall) to run an immense amount of machinery. Many excellent grist and saw-mills have been built on these streams, which will no doubt pay handsomely when the railroad is completed through the county, which now runs from Louisville to the Laurel county line, in the direct line towards Knoxville, Tennessee.

Timber.—Few counties have more fine timber than Laurel. Here is found, in great forests, the pine, hemlock, chestnut, walnut, cherry, sugar-tree, beech, larch, linden, oak, cedar, ash, hickory, and all other trees indigenous to this climate. The undergrowth consists of laurel, papaw, spice-wood, witch-hazel, hazelnut, gooseberry, whortleberry, haw, elder, dogwood, and large quantities of grape and other vines.

Crops, Orchards, and Vineyards.—Corn, wheat, rye, oats, flax, and tobacco, with a few "cotton patches," form the chief crops. The bottom and beech lands produce orchard grass, timothy, herds-grass, and clover in great luxuriance, and the hay is equal to any raised elsewhere. Tobacco has been cultivated only to a limited extent, owing to the distance from market; but its production is on the increase, as is also wheat. Apples, peaches, pears, plums, damsons, cherries, chestnuts, and all the smaller fruits and berries, scarcely ever fail of a good crop, even when the fruit is all or nearly all killed in the more level counties. Formerly peach and apple brandy were as common here as whisky is in Nelson or Bourbon, and the fruit was so perfect from which the brandy was made, that the liquor, from its mild character, was called the "Mountain Dew." But since the General Government has put such a heavy tax on distilleries, many of the sources of this sparkling dew have dried up, and left to the people only the legends of the good times of "lang syne." The vine grows here to perfection, and no doubt were vineyards properly cared for, such native grapes as the Concord, Ives Seedling, Hartford Prolific, Catawba, &c., could be made to yield over ten thousand pounds of this luscious fruit per acre, which would make over eight hundred gallons of wine, or a corresponding amount of brandy, equal in quality to that of France or Spain.

Stock, Bees, and Sheep.—One of the prominent features of this county is the luxuriant wild grasses and succulent vines and shrubs that clothe the sides of the hill and ridges. Vast areas of unoccupied lands here furnish almost unlimited and exhaustless range for cattle, sheep, and hogs. The native stock are generally descendants of the "old scrub," brought by the first settlers from Virginia and North Carolina; but these are fast giving way to the better bloods that are gradually being introduced from the blue-grass counties of Kentucky. The long-wool sheep are found to flourish well, and if ever the army of worthless curs can be reduced below a war footing, then sheep husbandry will be a leading industry in this county. The Devon and Short-horn Durham cattle are becoming quite common, and the people fast learning their superiority over the old scrub. The Poland-China and Berkshire are the favorite swine, but as yet the "razor backs" and "long-faced wattle breed" have possession of the acorn masts of the country. The farmers say they can make their "own living," and are not so easily picked up by every one who "has a claim" in the woods.

TOWNS AND VILLAGES.

The good people of Laurel are in no hurry to build large towns; they wisely wait till the railroad is completed.

London, the other extreme of its namesake, boasts its excellence in the *quality*, not the *quantity*, of its population. It is the county seat, contains about 100 people, has a good court-house, an academy, a mill, half a dozen mechanic shops, and several neat, comfortable private residences.

Hazelpatch, *Bush's Store*, *Chestnut Hill*, *Laurel Bridge*, *Mershon's Cross Roads*, *Raccoon*, *White Lily*, and *Whippoorwill* are all neat villages, each doing a large traffic in dry goods, groceries, the smaller industries of the country, peltries, and agricultural products.

Schools.—There is at London a good academy, under the control of able instructors. The public school system of the State has been inaugurated in every district of the county, and every neighborhood has a school at least five months in the year. The Laurel Seminary, under the charge of Prof. C. M. Boynton, is a flourishing institution, and has a high reputation for making good, thorough scholars.

Religion.—The Old (Hard-shell) Baptists are very numerous. The other denominations are the Free-will Baptist, the Methodist, the Reformer, the Universalist, and some few Presbyterians, Unitarians, and Catholics. The church buildings are not so fine as in some of the blue-grass counties, but probably the piety practiced in them is equally as sincere and faithful. The people go to church to listen to their neighbor's preach, and in their fullness of faith forget that the house is made of logs and covered with clap-boards, and the members are seldom caught asleep when placed as sentinels over the actions of their own hearts.

Smaller Industries.—Ginseng, beeswax, maple sugar, and molasses are produced in all parts of the county. The "seng hoe" formerly was as much a source of profit to the old hunters as the plow. The women manufacture from home-grown cotton, flax, and wool, jeans, linens, counterpanes, linseys, cottonades, socks, blankets, and all cloths needed for every-day wear, and enough surplus to traffic for "store goods" for their "Sunday clothes." Butter, eggs, chickens, ducks, guineas, geese, and feathers are produced in quantities, and traded to the country stores for sugar, coffee, salt, nails, and other things needed for family use. There are no large factories in the county, but several water grist and saw-mills, which do all the necessary business for the population.

The only development of coal has been to supply the blacksmiths of the country.

Game and Fish.—The fresh mountain streams are noted for their excellent fish, and the woods still abound in deer, some bears, wild turkeys, pheasants, raccoons, foxes, opossums, and other game, which are eagerly hunted by the citizens as well as by parties from the level counties, who go to this county on "camp hunts."

Future Prospects.—Laurel county has many superior undeveloped conditions;—but so much has been said by railroad speakers and politicians about what Laurel would become, *when that railroad was finished*, that I will stop short, and add not another word of prophecy; but will remark, she has a fine country for immigrants, who wish to obtain good lands at cheap prices, and to partake of her many natural advantages.

LAWRENCE COUNTY.

Situated in the extreme eastern part of the State, on the waters of the Big Sandy, this county was formed in 1821 from parts of Greenup and Floyd, and named in honor of Capt. James Lawrence, of the United States Navy. It is bounded on the north by Elliott, Boyd, and Carter counties, northeast by the Big Sandy river, which separates it from Wayne county, West Virginia, southeast by Martin county, south by Martin and Johnson, and west by Johnson, Morgan, Elliott, and Carter counties.

Geology, Minerals, and Soil.—The whole of Lawrence is based upon the true coal formation of the East Kentucky coal field. The surface is generally hilly, broken, and in some places mountainous. While the soil in the valleys and west and north slopes of the hills is very rich and productive, that on the ridges is rocky, and on the eastern and southern slopes less fertile. The coal fields of Lawrence are immense, and will no doubt at some future day be the source of great wealth to this portion of the State. The strata, according to the reports of the Geological Surveys, to which reference is here made, vary from a few inches to seven feet in thickness, and are composed of both the cannel and bituminous kinds. The quality of the coal will compare favorably with that

of Western Pennsylvania and West Virginia, of which the East Kentucky fields are a continuance. Iron ores exist in large quantities, similar to those of Carter, Boyd, and Johnson counties. Mineral springs are numerous, the waters of which are said to be excellent for all kinds of chronic diseases.

Timber and Streams.—Lawrence is one of the best timbered counties in Kentucky. Here are unbroken forests of pine, hemlock, all kinds of oaks, walnut, hickory, butternut, elm, ash, cherry, chestnut, maple, sugar-tree, larch, linden, wahoo, ironwood, beech, box elder, birch, hackberry, cottonwood, sycamore, willow, sassafras, persimmon, gum, poplar, cucumber, locust, hornbeam, and the smaller kinds of undergrowth, such as are usually found in the mountain regions of this latitude. Big Sandy river, Little Sandy, Blain creek, Rockcastle, and West Fork, and their tributaries, afford most excellent water-power to this county for mills, factories, and furnaces. Steamboats can run in the Big Sandy and West Fork during the winter and spring months, and slack-water navigation could easily make them navigable the entire year. Rafts and lumber, which are sawed in large quantities, are floated out of these streams into the Ohio, where they find a market, or are taken to Cincinnati and Louisville.

Agriculture.—Corn, wheat, rye, oats, and tobacco are the principal crops; hay is raised for home use, and sorghum molasses is made in considerable quantities. The native mountain grasses afford excellent pasturage for cattle and sheep, and “the sweet and bitter mast” supply fall and winter food in abundance for the native stock of hogs. Not much pains have been taken to improve the breeds of live stock, the old scrub kind still holding complete control, except in a few neighborhoods. Probably no part of the Mississippi Valley is better adapted for sheep husbandry than Lawrence, and nowhere are the grasses and bitter shrubs better suited for sheep grazing, or tend to make a better flavored mutton or a superior article of wool. In all kinds of fruit this county excels. The apple, peach, pear, quince, cherry, plum, &c., all grow to perfection, and rarely ever fail of a full crop. Grapes do well on the hill-sides, and the native vines, such as the Four Stars, Concord, Ives Seedling, Hartford Prolific, and Delaware, here produce berries of large size, and most exquisite flavor, either for eating or for wine. If the people would turn their attention to vineyards nothing would pay them better. (See Wine-making under the head of Washington county.)

TOWNS AND VILLAGES.

Louisa, the county seat, is beautifully located on the Big Sandy, at the mouth of the West Fork, twenty-five miles above Catlettsburg, where the Big Sandy empties into the Ohio. It contains about six hundred inhabitants, has four fine churches, two academies, a good court-house, and other public offices, wool-carding, grist and saw-mill, half a dozen mechanic shops, and several excellent, neatly-appointed private residences.

Sandy Furnace, Peach Orchard, Eden, Lowmansville, George Creek, Glentwood, Webbville, Clifford, Cherokee, Blaine, Buchanan, and Prosperity are all neat, thriving villages, each doing a considerable local trade.

Furnaces and Mills.—Two furnaces are actively at work, and others in contemplation, to smelt the iron ores which are practically inexhaustible in this county. When slack-water navigation is fully completed, and railways are built into this section of county, there will be an advance in the manufacturing enterprises that is not now even imagined by the most sanguine. There are in the county several large and well-managed grist and saw-mills that make large amounts of lumber for export, besides numerous mechanic shops and tanneries. The different coal banks now worked, except those used by the furnaces, employ but few laborers, owing to the want of easy transportation for the products; and very little coal is used for house fires, in a country where wood is so very plenty that thousands of feet of the very best lumber are every year destroyed, by wastefully deadening the trees, and rolling and burning the logs.

Churches.—The Iron-side Baptist, the Methodist, Reformer, Missionary Baptist, Presbyterian, Catholic, and Universalist, are the principal Christian denominations. The church buildings are of primitive architecture, but commodious, and well suited to the wants of intelligent, honest seekers after truth, who prize good and noble works and a zealous faith more highly than they do glittering cupolas, cushioned seats, or fashionable loud-sounding sermons, preached by high-salaried priests or sermonizers with a plethora of words and a paucity of humble piety.

Schools.—There are two good academies at Louisa, and several other private schools in the county, in addition to the free common schools now taught in every district upon the State system. The people pay more attention to schooling their children, and show a commendable zeal in having them accept all the advantages to be derived from the public schools.

Domestic Arts.—The industrious, worthy ladies of Lawrence, like their sisters in several other counties, employ a large proportion of their time in manufacturing cloth for home use upon the old-fashioned hand-looms. The spinning-wheels, the distaff, and the warping-bars are familiar pieces of furniture in every neighborhood, and hundreds of yards of linseys, jeans, cottonades, linens, carpeting, blankets, and counterpanes are made every year. The home demand is first supplied, and the balance is traded to the country merchants for “store goods” and groceries. They also traffic for Sunday wear, and groceries, eggs, butter, poultry, feathers, beeswax, home-knit socks, maple sugar, tree molasses, and ginseng root. Furs and peltries are also traded by the hunting men.

Fish and Game.—Lawrence is noted for its fine fishing and hunting sports, in which a Lawrenceite delights above all things; and even at the risk of letting grass grow in his corn, will he pursue the game or handle the fishing rod. Many hunting and fishing parties from other counties often go to this county to enjoy the salubrious mountain air and the fine sport of the rod and the chase.

The People.—The citizens of Lawrence are noted for their intelligence, kind heartedness, and genuine hospitality. They know well the great riches which their county contains in iron, coal, timber, and farming lands, and are anxious to have immigrants from other States and countries come and settle among them and aid in the development of the county.

LEE COUNTY.

Lee county was formed in 1870 out of parts of Breathitt, Estill, Owsley, and Wolfe counties, and called in honor of General Robert E. Lee. It is bounded north by Powell and Wolfe, east by Breathitt and Owsley, south by Owsley, and west by Estill county.

Geological Formation and Soil.—Like Estill county, Lee has a variety of rocks running from the upper Silurian or Waverly through to the true upper coal measures. The lowest series are found only in the deep cuts of the Kentucky river and the Three Forks, which concentrate near the town of Proctor, while the uplands overlie almost exclusively the

carboniferous formations. The bluffs of the Kentucky river present most excellent examples of the stratifications of the knob stone, the Lithostrotion or mountain limestones, the conglomerate and mill-grit sandstones, and afford to the geological student a practical illustration of how the earth's crust was formed, by the accretion of the sedimentary rocks in the long cycle of ages that passed in preparing it for the higher orders of vegetable and animal life. Then come the periods of countless ages, forming coal and burying in vegetable muck, shale, and shells, the excess of carbonic acid gas, sulphuretted hydrogen, and other poisons that surrounded the globe with their pall of mephitic vapors. After all this was done, lastly came the tertiary and quaternary periods to fill the bottoms and hollows with soils from the disintegrated rocks, and sow them with grasses, shrubs, and trees ready for man's use when he should appear at the proper time on the earth's surface.

The face of the country is broken, and in many places mountainous. Coal and iron abound in every neighborhood in quantities practically inexhaustible. Thousands of bushels of coal, every year, are shipped down the Kentucky, though this is but a tithe of what could be done if slack-water navigation was completed to the Three Forks. Not less than five strata of good coal are to be found in the hills of this county, and also shale over 100 feet thick. The iron ores are limonites and hydrated oxides, with some beds of proto-carbonates of iron. These ores are generally adjacent to the shales, but sometimes found in the clays near the mountain limestone. The face of the country, when rolling, presents much land suited for farming or grazing. The Kentucky ridge, a spur of the Appalachian range, skirts the northern part of the county, while an offshoot from this ridge passes through the county from the northwest to the southeast, and continues to the Cumberland river in Bell county.

Timber and Saw-mills.—Immense forests of the finest hard and soft timber exist all over the country, containing walnut, pine, hemlock, cherry, black locust, holly, chestnut,* all kinds of oak, spruce, box elder, hickory, gum, poplar, sugar-tree, ash, buckeye, maple, beech, wahoo, leatherwood, ironwood, hackberry, and every other kind of growth indigenous to the latitude. Grapevines, papaws, witch-hazel, spicewood, haw, sumach, prickly ash, dogwood, whortleberry, chinquapin, &c., &c., &c., form the principal undergrowth. There are a large number of steam and water saw-mills that prepare from these forests lumber, both

for home use and export, and millions of feet of choice logs of walnut, cherry, &c., are shipped each year to the Louisville, Cincinnati, and some even to the European markets.

Productions.—Corn, wheat, oats, and tobacco are the main crops, although rye, flax, potatoes, barley, and other farm products do well. The uncertainty of navigation has prevented the farmers from exerting themselves as much as they do in some other counties, to raise large crops. Flax grows here most luxuriantly, as it does in all Eastern Kentucky; and now that a brake has been invented that will clean several hundred pounds of lint at a very trifling cost, we hope to see this made a staple crop, which will, no doubt, pay better than corn, wheat, or tobacco. Nowhere will orchards and vineyards pay better than in Lee county. Wine and brandy can here be produced as cheaply as in France or Spain, and of just as good quality. Apples, peaches, plums, damsons, cherries, and pears scarcely ever fail of a good crop; and if the native varieties of grapes, which experience has proved are suited to our climate and soil, were planted, and were well cared for, over ten thousand pounds per acre could be raised, which would produce over eight hundred gallons of excellent wine, or a corresponding amount of brandy. Apple and peach brandy was once *the drink* of the mountaineers; but the odious tax now put on distilleries by the Federal Government has nearly dried up the sources of these most healthy and palatable of beverages, and the "Mountain Dew" has almost ceased to cheer the hardy husbandman, as he sets out on his daily rounds of labor.

Live Stock, Sheep, and Hogs.—The mountain meadows, the rich nutritious ridge grasses, the luxuriant pea-vine, and the various shrubs suited for browsing, point out this county with unerring certainty as the home of all kinds of live stock. Hogs grow fat on the mast without corn, and pigs are raised without trouble or care in the forests or around the farms. The long-nosed wattled breeds, known as razor-backs, are most common, as they have by inheritance learned how to "shift for themselves," and make a living in the woods. The common native sheep and cattle, too, roam the woods without shepherd or master, and thrive well on what they can "pick up." Very little care has been taken to improve the stock, until of late years some few Durham bulls and Cotteswold rams and Berkshire boars have been introduced into the county.

Mineral and Salt Springs.—There are two great water beds in Kentucky, the calciferous sandstones underlying the Silurian rocks, and the

great sandstone formation at the base of the coal measures belonging to the age of the millstone grit. The latter exists over Lee county, and from its source come many chalybeate, sulphur, and salt springs, similar to the Estill springs, near Irvine. In early times the first settlers made salt from the salt springs or wells; but of late years it can be made so cheaply elsewhere that the people have ceased to use the waters.

TOWNS AND VILLAGES.

Beattyville and *Proctor*, the one on the north bank and the other on the south bank of the Kentucky, just below the mouth of South Fork, are places of large trade. The former is the county seat, and contains about one hundred and fifty people. It has a good court-house, an academy, grist and saw-mills, several churches, and half a dozen mechanic shops. Proctor is about the same in population, and does a large trade in lumber, coal, and farm products. In these two towns are probably over twenty coal mining companies, who ship coal and timber down the Kentucky river.

Canaan is a happy little town of fifty inhabitants, well satisfied with their position in the "promised land," so long as they can concentrate the large lucrative trade and traffic which naturally turns to this point.

Old Landing is a place of considerable traffic in coal, timber, peltries, and home-made goods.

Streams and Water-power.—Kentucky river, the North, Middle, and South Fork, all run through this county, and give most excellent water-power for any quantity of machinery. If slack-water is ever continued to the Three Forks or above that point, each of these streams will afford never-failing navigation. Sturgeon creek and its tributaries have good fall, and are excellent mill streams.

Education and Religion.—Proctor and Beattyville have each finely-taught academies. The public schools are in operation in every district in the county, and more than usual interest is now manifested by the people to have their children learn the elementary branches, and many patronize the higher schools or academies. The "Iron-clad Baptist," the Free-will Baptist, the Reformer, Presbyterian, and Episcopalian are the principal denominations of Christians in the county. Church buildings are in every neighborhood, so that no families are compelled to go over five or six miles to church.

Home Factories.—As elsewhere in Kentucky, nearly all the lesser manufactories are conducted by the ladies, who card, spin, and weave nearly

all the cloth used in every-day wear, and much for traffic to the merchants in exchange for "store goods." They also produce, for consumption and export, large amounts of beeswax, home-made sugar and molasses, feathers, eggs, butter, poultry, &c., &c. There are families who in the summer get a considerable income from digging the roots of ginseng and other medicinal plants.

Game and Fish.—The mountains still have bear, deer, turkeys, pheasants, raccoons, &c., in abundance, and the streams contain game fish of every description to be found in the western or mountain rivers or creeks.

LETCHER COUNTY.

In 1842, from parts of Harlan and Perry, Letcher county was formed, and named in honor of Governor Letcher. It is bounded on the north by Perry and Floyd, east by Floyd, Pike, and the Virginia State line, south by the Virginia line, Harlan and Perry, and west by Perry county.

Topography, Geology, and Soil.—This county is entirely among the mountains, in the southeastern part of the State, and borders along its southeastern line, on the cap ridge of the Cumberland range. Black Mountains are on its southern border, and spurs of the Kentucky ridge and Pine Mountains pass through different parts of the county. The base rocks are of the true coal measures, upheaved and disturbed in many places by the mountain ridges and faults, the most noted of which is the great fault that passes from southwest to the northeast between the Pine Mountains and Kentucky ridge, and which brings the coal in many places along its course on the same horizon with the water-courses. Coal and iron ores abound throughout the county, and salt, sulphur, and chalybeate waters are found in numerous localities. Formerly many of the citizens thought gold, copper, lead, and silver existed in large quantities; but when these ores were scientifically examined, they were found to be pro-carbonate of iron, mixed with alumina or some such metal. No plutonic or granitic rocks have ever been found on the surface in this county, and *no true vein or lead of metalliferous quartz or rocks that show igneous action.* These are always found in position

where the precious metals exist in true veins, and their absence is *prima facie* evidence that the bonanza of gold or silver will never be found here. But iron, which is more useful, and coal, which is necessary to man's comfort, exists on thousands of acres, any one of which can yield enough of these to bring in the London or Paris or New York market from \$80,000 to \$100,000. Of course the land-owners in Letcher would discount, to make sales, greatly from these figures, if the purchaser would take the coal and iron ore where they lie.

Streams and Water-power.—The fall of the streams in this county is great, and the water-power abundant for any amount of machinery that may be employed in mills, forges, or factories. North Fork of Kentucky river and its branches, Leatherwood, Bull's Run, Kingdom Come, Boone's, and Carr's creeks, are all fine mill streams, having many natural rapids, where low dams would produce great power.

Timber.—The forest growth of this county has scarcely been touched; but is standing, in its primitive condition, over more than seven eighths of the lands. The chestnut, pine, hemlock, all kinds of oaks, fir, linden, walnut, maple, locust, sugar-tree, elm, beech, gum, larch, poplar, cherry, &c., &c., are found, of immense size, and in quantities practically inexhaustible. All kinds of mountain berries, wild fruits, vines, and undergrowth and flowering shrubs abound, and make the hills and valleys look like the gardens of nature. Nowhere in the State are there more stately trees or a greater variety of vegetable growth, from the pea-vine to the majestic oak.

TOWNS AND VILLAGES.

Whitesburg, the county seat, is handsomely located on the North Fork of Kentucky river, about the middle of the county, and contains about one hundred and fifty people. It has a good, comfortable court-house, an academy, a mill, and several mechanic shops. *McPherson*, *Rosedale*, *Partridge*, *Stony Gap*, and *Indian Bottom* are neat villages, each doing a considerable traffic in peltries, home-made goods, ginseng, and country produce, for which dry goods, groceries, ammunition, and liquor are given in exchange. Like the good people of Harlan county, the free-born Letcherites will not stand the close confinement of wheeled carriages, but most generally thread their course along the mountain paths on horseback, or in the more primitive fashion, *on foot*, without dread from the accidents of runaway teams or bursting locomotives.

Schools and Churches.—The common school system has been extended into every district in the county, and the people are becoming more

interested in having their children taught the common rudiments of an English education. There is a good academy at Whitesburg, under the charge of an able instructor, where the higher branches are taught to those desirous of a more liberal course of study. The Primitive (Hard-shell) Baptists are the most numerous church, the Methodist, Free will Baptist, Reformers, and Universalist have churches and good congregations. The buildings are primitive in design and architecture, but they answer the purposes well for those who are in faith and practice meek and lowly, while the proud and worldly would not be much benefited, even under tall cupolas, on cushioned seats, and under the sermons of high-salaried fashionable priests or preachers.

Manners and Customs.—The intelligent people of Letcher are frank, open, generous, and manly in their habits and customs, using no unnecessary etiquette or French politeness in the entertainment of their guests. Quilting frolics, log-rolling, apple-parings, house-raising, and rifle-shootings, are common amusements, where the useful and ornamental are harmoniously blended. On such occasions, after the work is over, there is a good substantial dinner or supper, with plenty of venison and well supplied with "Mountain Dew" distilled from the pure peaches or apples of the mountain orchards. Then the old men talk politics, eligion, and crops, the old ladies tell about the "yerb" teas and croupy babies, or the latest new quilts, while the young lads and lasses join in a most soul-stirring dance to the music of a country fiddler, or play "grind the Bottle," "Sister Phebe," "Thimble," "Selling Pawns," "Weaverly Wheat," and blind man's buff, or some other country plays. Everything is joyous, and all are well pleased, and no one waiting for introductions, or fearful of offense because of not having on fashionable apparel, or because of difference in birth, wealth, or education. Everybody is happy, and tries to make everybody else happy, and when the frolic is over all go home, the handsome lass frequently riding on the same horse behind her sweetheart. If any people on earth live nearer to the gates of Paradise than others, they are these.

Stock and Crops.—The wild pea-vine, the mountain meadows, the ridge grasses, the variety of succulent budding shrubbery, and the unconquerable canebrake, show that this is the natural home for stock of every kind. For eight months in the year the herbage is green, and on the sheltered sides of the ridges and the mountains grass and moss can always be found in abundance for sheep and cattle. Nowhere will long-wooled sheep flourish better than in this county. Cattle rarely need

feeding, except when deep snows prevail, or bleak winds chill them. Hogs find mast, nuts, and roots to supply them, and keep them fat, at all seasons of the year. Corn, wheat, and oats are the principal farm crops, and these are cultivated only for home use, owing to the distance from the markets of the world. Cotton and flax patches are to be found on every farm, just sufficient to supply family clothing. Flax is well suited to the lands, and will, no doubt, become a chief staple of export when the people get among them the newly invented brake, that cleans several hundred pounds of lint per day at a mere nominal cost. Orchards and vineyards would do as well here as in any county in Kentucky. Fruit rarely ever fails of making a full crop. Wine and brandy can be made here as cheaply, and of as good quality, as in many parts of France, Germany, or Spain.

Domestic Manufactures.—Farming is not carried on so largely as in many other counties, proportionately to the population; but nowhere do the female portion of the people more industriously do their part in supporting and clothing the family. From the “cotton and flax patches” and native grown wool they manufacture a sufficiency of jeans, linseys, linens, cottonades, flannels, blankets, counterpanes, and other kinds of cloth, not only to supply the home consumption, but also to traffic for such “store goods,” including sugar and coffee, as may be needed. They also make and sell butter, raise poultry, gather ginseng, honey, beeswax, fruits and berries, and prepare them for market. Maple sugar and molasses are manufactured in quantities for home use.

Hunting and Fishing.—These are favorite pastimes, if not real employments, to the men of Letcher—not to all, but to that class of philosophic minds who consider it more dignified to carry the rifle and rod than to follow too assiduously the plow. Game and fish are plenty, and no family is long without the dainty food procured by the chase, the still hunt, and the fishing tackle. The mountain brooks are famous for their bass and trout, and a native bred Izaak Walton cannot easily forego the exciting sport, even if all other work goes undone.

The growth of population is not so great in these mountain counties from immigration as it is elsewhere; but the people are prolific, and the numbers are fast increasing. Owing to the narrow breadth of arable lands, agriculture is partially neglected; but, for the purposes of mining, sheep husbandry, orchards, vineyards, and flax culture, there is no better country anywhere, or a more hardy, generous, hospitable population, who desire immigrants to come among them.

LEWIS COUNTY.

This county, named for Capt. Merriwether Lewis, was formed in 1806 from a part of Mason, and is bounded on the north by the Ohio river, which separates it from the State of Ohio, east by Greenup and Carter, south by Carter, Rowan, and Fleming, and west by Fleming and Mason counties.

Topography, Geology, and General Appearance.—This county is located in the northeastern part of the State, on the Ohio river, and is one of the most diversified in its soil, surface, and rocks to be found in Kentucky. Its western border is based upon the lower Silurian, the central on the upper Silurian and Devonian shale, its east middle on the Waverly silicious groups, and its east border on the sub-carboniferous, extending into the true coal measures. The face of the country is generally hilly, and the soil in the different parts of the county corresponds to the underlying rocks, so that no two neighborhoods, as you go east or west, correspond in the general appearance of the surface or growth of trees. Some of the lands are very fine; others "sobby beech," good for hay; others covered with the finest oaks, and underlaid with iron ores, and abounding in mineral and salt springs; others again of good second-rate beech, cherry, and walnut lands, with papaw undergrowth; then we find good tobacco soils, then thin sandy soils, with large cliffs, and finally the regular coal soils, filled with the material necessary to produce excellent flax, corn, tobacco, fruits, and vineyards; and where the sand rocks come to the surface, a poor, thin earth, well adapted to peanuts, grass nuts, persimmons, and whortleberries. The magnesian limestones exist in large quantities in this county; in fact, there is a variety of limestones, knobby sandstones, mill-grit, shale or slate, and other rocks found here that is really astonishing. The bluffs vary from three hundred and fifty to seven hundred feet above low water in the Ohio river, and in that perpendicular distance are many of the best quarries of building stone (both lime or magnesian and sandstone) to be found in the West. Cincinnati, Louisville, and other cities send here for fine freestone fronts for public and expensive private buildings. The quarries contain inexhaustible quantities of white, brown, and yellow stone, which is not perceptibly affected by the freezes or exposure to water. Copperas is found in the Devonian shale formation, and also slate or shale

over one hundred and forty feet in thickness, which accounts for the fine mineral waters running from natural springs. The iron ores are everywhere accompanying the shale formation in greater or lesser quantities, and may in the future become a source of profitable manufacture. The coal in the eastern part of the county is not in amount sufficient to induce capitalists to invest largely, when Greenup and Carter adjoining are filled with such excellent beds of both iron and coal.

Timber.—The timber was once exceedingly fine in this county, though much of it has been used. It varies with the nature of the soil, and embraces every variety indigenous to the north temperate zone. The knobby lands produce chestnut and black oak in great abundance, which yields the finest tan-bark known in the Western country. Large quantities of this bark is exported every year to Cincinnati and other points, to be used in making the better qualities of leather.

Streams and Water-power.—The Ohio river affords never-failing transportation for the products of the soil to all parts of the country. Kiniconick and its branches, Cabin and Sycamore creeks, have fine falls, and are good mill streams. Several large flouring and saw-mills have been erected, which do a profitable business in custom work and exports.

Orchards and Vineyards.—This county has a large quantity of land very similar to the best grape lands in Germany, which, when tested, will probably prove equally as well adapted for grapes and wine-making. The high ridges and hills produce excellent fruit-trees of every kind. Apples, quinces, pears, plums, and cherries grow in great perfection, and scarcely ever fail of a full crop. The smaller fruits, nuts, and berries do well, and are generally cultivated throughout the county. Chestnuts, hickory-nuts, walnuts, chinquapins, papaws, wild cherries, wild plums, wild grapes, haws, crab-apples, persimmons, huckleberries, and other wild fruits, grow in profusion.

Live Stock.—Owing to the contiguity of Lewis to the blue-grass counties proper, we find here choice breeds of horses, cattle, swine, and sheep. Good racers, trotters, and riding horses and work mules, are common. The Short-horn, Devon, Jersey, and Alderney cattle are the favorites. The Cottswold, Shropshiredown, Merino, and Southdown are the best stocks of sheep, and of these many superior specimens are found in different neighborhoods. Some of the Cottswold weigh from 300 to 400 pounds, and shear fleeces of 20 to 30 pounds. The Woburn, Essex, black and red Berkshire, and Poland-China are preferred among

the hogs—some breeders preferring the one and others a different blood or cross. Poultry has been improved of late years by the addition of European and Asiatic chickens, ducks, geese, and turkeys.

TOWNS AND VILLAGES.

Vanceburg, the county seat, is handsomely located on the Ohio river, 30 miles above Maysville, and contains a population of over 600 persons. It has a fine court-house and other public buildings, steam grist and saw-mills, several fine churches, an academy, more than a dozen mechanic shops, a tannery, and many elegant private residences.

Clarksburg, 12 miles below Vanceburg on the Ohio river, contains about 300 inhabitants, a good academy, several mechanic shops, and fine churches.

Quincy is 11 miles above Vanceburg, on the Ohio, and is a place of large local trade.

Poplar Flat, *Tollsboro*, *Cabin Creek*, *Carr's Store*, *Concord*, *Dudley*, *Marine*, and *Sand Hill* are neat villages, each doing the local trade of the neighborhood.

Education and Churches.—The public schools, under the State plan, are taught in nearly every district, and the people are fast becoming favorably disposed towards a thorough system of education, by which the rudiments of the English branches can be taught to all the minors in the county. There are good academies at Vanceburg and Clarksburg, under the superintendence of able, well-qualified professors, who take great delight in giving instruction, in the higher classes of studies, to their scholars. The principal religious denominations are the Baptist, the Reformer, the Methodist, the Presbyterian, Episcopalian, Universalist, and Catholic. Churches are located in every neighborhood, and but few families have to ride more than four or five miles in attending worship.

Domestic Arts.—Some home-made cloth is still manufactured by the good ladies of Lewis; but the music of the wheel and loom is not so common as it was thirty years ago; many families have quit spinning and weaving, and depend on the products of the farms, fruits, dairies, and stock to bring in money with which to buy clothes and supplies. Eggs, butter, cheese, dried fruit, maple sugar and molasses, ginseng, hand-knit socks, feathers, and poultry are articles of profitable traffic, and are produced in quantities. There are no large factories, but many

saw and grist-mills, tanneries, wagon and carriage shops, and stone quarries, which export largely to Cincinnati, Maysville, and other points.

Crops.—Corn, wheat, rye, oats, and hay are the principal crops. Tobacco is grown in some neighborhoods, and quite a fine article raised similar to the "Mason County Leaf." The bulk of the grain raised in the county is fed to the stock, which are in turn generally sold on the hoof in the Maysville, Newport, Covington, and Cincinnati markets. The lands, in many parts of this county, could be greatly improved by the use of chemical or mineral fertilizers, particularly those manures containing sulphate of lime, potash, nitrogen, and phosphoric acid.

Game and Fish.—There is still a considerable amount of game in Lewis county, and fine fishing in the creeks passing into the Ohio river. Companies frequently go from the adjoining counties to enjoy the fine sport among the creeks and hills of "old Lewis."

LINCOLN COUNTY.

This county was formed by the Legislature of Virginia in the year 1780, and was one of the three original counties. It was named in honor of Gen. Benjamin Lincoln, and originally contained territory from which has since been formed one third of the counties of the State. It is at present geographically of small extent, and is bounded on the north by Boyle and Garrard, east by Garrard and Rockcastle, south by Pulaski and Casey, and west by Casey and Boyle counties.

Geology and Soil.—The variegated formations of this county give a peculiarity to the surface and soil, which is seldom seen elsewhere in the State. Beginning with the upper Cambrian or lower Silurian, we find the upper Silurian, the Devonian black shale, the Waverly sandstone, and the sub-carboniferous limestone in close proximity, yet each in its proper geological location. In the northern part of the county are found the Silurian rocks, with rich rolling surface lands. Next to the southern part of Garrard county appears the magnesian limestone of the upper Silurian, with here and there admixture of black shale, where the spurs of the ridges overlap that formation. This gives a very good arable soil, which

can be greatly improved by the use of lime, gypsum, and superphosphates. The black shale formation, with large quantities of disseminated carbonates of iron, can be traced by the knobby formation through this county into Casey. Flat Lick creek region contains, probably, the most extensive beds of iron ore in the county, which might be utilized with profit, the metal being similar to that of Nelson and Bullitt counties. In the southeast part of the county the sub-carboniferous limestones come to the surface, giving a soil well adapted for small grain, fruit, and tobacco.

Agriculture.—Portions of Lincoln county belong to the Blue Grass Region proper, and are admirably adapted to the growth of grass, and to cattle grazing; other parts of the county are less suited for grazing, but well adapted for wheat, oats, barley, corn, and tobacco. The blue-grass and creek bottom lands are very fertile, and produce good hemp, corn, the smaller cereals, and grasses suited for meadows. Fruit of all kinds, such as apples, peaches, pears, cherries, plums, quinces, &c., do well on the ridges, knobs, and hills, and rarely ever fail to produce a full crop. So far as vineyards have been tried they have proved a success, and the native improved vines yield excellent vintage.

TOWNS AND VILLAGES.

Stanford, the county seat, is situated on the Lebanon Branch of the Louisville and Nashville Railroad, in the northern part of the county. It contains about 1,000 inhabitants, has a fine court-house, and other public offices, two grist and saw-mills, woolen factory, several churches, two academies, a private school, a dozen mechanic shops, and many handsome private residences.

Crab Orchard, a famous station in the early settlement of the country, has now a population of about 800, and is celebrated as the most noted watering-place in Kentucky. The Crab Orchard Springs, besides being used by invalids from all parts of the West and South, also produce annually large amounts of the "Crab Orchard Salts," which are becoming widely known for their medicinal virtues.

Hustonville, a beautiful town of four hundred inhabitants, about six miles southwest from Stanford, is a place of considerable commerce. *Highland*, *Turnersville*, *Walnut Flat*, *Waynesburg*, *Power's Store*, *Milledgeville*, *Bee Lick*, *Hall's Gap*, *Hayden's*, and *Richmond Junction*, are all neat, thriving villages, each doing the necessary trade of its neighborhood.

Churches—Every neighborhood in Lincoln county is adorned by one or more fine church buildings, which usually are attended by large congregations. The principal of these sects are the Primitive Baptist, the

Reformer, Catholic, Methodist, Presbyterian, Missionary Baptist, and Universalist.

Schools.—*The Stanford Female College*, located at Stanford, under the able management of Mrs. S. C. Truehart, and an excellent corps of assistants, gives instruction to 125 students. This large number of misses and young ladies comes from Lincoln and the adjoining counties. There is also a good male academy at Stanford, in which the higher branches of English and the languages are taught. *The Christian College*, at Hustonville, is a well-managed institution, under the control of Miss Hannah Burgin. *Tarrant College*, a flourishing institution, under the management of Mrs. S. F. H. Tarrant, is located at Crab Orchard. The State free common school system has been inaugurated, and now a school is taught in every district in the county, so that every child can be well educated, unless there is neglect on the part of parents in not sending their children regularly to the schools.

Live Stock.—The better breed of all classes of live stock are to be found in Lincoln, although in some neighborhoods less pains are taken in improving breeds than in others. Large numbers of mules are raised for the Southern markets, and hogs and cattle for the Louisville trade. The favorites here are, of cattle, the Durham, Short-horns, and Alderneys; of sheep, the Cotswold and Merinos, and of swine, the black and red Berkshires, Poland-China, and Chester-Whites. The part of this county which is least adapted for mules and cattle is best suited for sheep, and here flocks of Cotswold and Merinos can be made to pay as well as in any part of the United States.

Smaller Industries.—In many neighborhoods the good, industrious ladies still make, on the hand-looms, a sufficiency of cloth for everyday wear, and add much to the coffers of their liege lords by trafficking linseys, jeans, counterpanes, home-knit socks, poultry, eggs, butter, feathers, maple sugar, tree syrup, and ginseng to the country merchants for "store goods" and groceries, which otherwise would cost these gentlemen net cash.

The People.—The citizens of Lincoln are noted for their intelligence, refinement, industry, and hospitality. They know the necessity of having the great resources of their county in iron ore, timber, coal oil, and rich land developed by an industrious, skillful class of immigrants; and they would give a hearty welcome to all such as will come and live among them.

LIVINGSTON COUNTY.

The year 1798 is memorable in the annals of Kentucky as the year when new counties were formed with a facility that would now astonish the most sanguine novelist. It was then that this county, amidst more than a dozen others, was brought into existence, and named in honor of Robert R. Livingston. It was cut off from the extreme western part of Christian (which then extended to the Ohio river), and is now bounded on the north by the Ohio river, which separates it from Illinois, and by Crittenden county, on the east by Crittenden and Lyon, south by Marshall and McCracken, and west by the Ohio river.

Navigation and Railways.—The Ohio river forms the west and north boundary, the Tennessee river the southern boundary, and the Cumberland the eastern boundary for about one third of its extent, and then runs centrally through the county. These three streams afford means for perpetual steamboat navigation to every neighborhood in the county. The Louisville and Southwestern Railroad passes through the eastern border, giving daily communication to all the country north and south; thus no part of Livingston is wanting in traveling or transportation facilities.

Minerals and Soil.—The geological basis of this county is the sub-carboniferous limestones, except a few outcrops of the mill-grit and conglomerate sandstones and the Chester group, occasionally running into the lower strata of the true coal measures. The coal that has been found in this county cokes well, and would be good for gas-making; but the mines are not extensive. There are several places where lead and fluor spar has been found in considerable quantities; but so far no mines have been tested sufficiently to tell their actual extent. The general appearance of the surface is undulating—in some places hilly—and quite broken and rough, with limestone and sandstone rocks interspersed throughout large areas. Iron ores similar to those of Trigg and Lyon counties are found in many localities, and in large quantities. The soil on the river bottoms is exceedingly rich, while the upland soil is second-rate, and much of the ridges and hills rocky and unfertile.

Agriculture.—Corn, wheat, oats, rye, flax, the hay grasses, and tobacco, all grow luxuriantly, and seldom fail of making good crops. Cotton is cultivated to a limited extent for home use, and peanuts are becoming

quite a crop of profit. The tobacco of this county is sold at Paducah and Louisville, and makes up some of the best shipping leaf that goes into these markets. The hay grasses, such as clover, herds-grass, timothy, Italian rye grass, orchard-grass, Hungarian, and millet do well, particularly on the bottom lands, where hay can be raised and shipped as cheaply as in any portion of the Ohio Valley. In live stock Livingston county has not made such advances as many other sections, although large numbers of mules, hogs, and some sheep and cattle, are exported every year. The scrub breeds still hold full sway, and but few farmers trouble themselves in selecting and keeping up the best pedigrees of either cattle, sheep, or hogs. In this a great improvement is needed, as well as in the system of rotation of crops and fertilization of the lands. The country is well adapted for sheep husbandry, if the dog laws could be rigidly enforced, and bee culture could here be made as profitable as in any other section of the State. Fruit does well in all the highlands.

TOWNS AND VILLAGES.

Smithland, the county seat, is located at the mouth of Cumberland river, where it empties into the Ohio. It contains some seven to eight hundred inhabitants, a good court-house and other public offices, several churches and mechanic shops, and many well-built private residences.

Salem is a beautiful town of some three hundred inhabitants, in the northern part of the county.

Birdsville, *Carrsville*, *Bayou Mills*, *Pinkneyville*, and *St. Bernard* are neat villages, each doing a considerable local trade.

Churches.—The Methodist, Baptist, Reformer, Presbyterian, and Catholic are the principal religious denominations. The church buildings are generally primitive in their architecture, but sufficiently elegant to suit the tastes of the true Christian who worship in them, and who are more proud of performing good deeds, and having a reliable faith, than they would be in visiting fine churches with cushioned seats, and listening to the studied phraseology of high-paid preachers, who speak to tickle the ear and to retain good pay rather than to proclaim the doctrines of humility and love.

Schools.—There are several good private schools in the county in addition to the free public primary schools, which are taught in every district, according to the State common school system. The people are every year becoming more and more interested in the public school system, and exhibit a commendable zeal in having their children accept of

all the advantages to be derived from sending their children to these institutions.

Domestic Arts.—While the male portion of the population are attending to the farms and live stock, the energetic and frugal females are employed in attending to the domestic affairs of housekeeping, and the manufacture of cloth for the every-day wear of the family. Jeans, linseys, linens, cottonades, blankets, counterpanes, and other useful articles, are woven on the old-fashioned hand-loom, to which the busy spinning-wheels play an accompaniment, to which is added the gay songs of the maiden or matron spinners. In addition to cloth and other every day articles of value, they traffic largely with the country merchants in home-knit socks, poultry, eggs, feathers, beeswax, flaxseed, maple sugar, tree molasses, and ginseng, and they supply the stores with many other useful articles of home production.

The People.—Like other agricultural communities in Kentucky, the citizens of Livingston are energetic, careful, and saving, remarkably intelligent and hospitable, and well aware of the fine natural resources of their county, and are anxious to have other persons from distant States and countries to come and settle among them, and share their rich lands and other benefits. To all such they will give a most hearty welcome.

LOGAN COUNTY.

This county was one of the first formed after Kentucky became a State in 1792, and named in honor of Gen. Benjamin Logan. When first formed it embraced nearly all the territory south of Green river. It has been trimmed and cut down, until now it is bounded on the north by Muhlenburg and Butler, east by Warren and Simpson, south by the Tennessee State line, separating it from the county of Robertson in that State, and west by Todd county.

TOWNS AND VILLAGES.

Russellville, the county seat, is handsomely located, about the centre of the county, on the head waters of Muddy river, and immediately on

the Louisville and Memphis Railroad, and at the crossing of the Owensboro and Nashville Railroad. It contains a population of about two thousand people, is the site of Bethel College (male) and Logan Female College. It has two steam flouring mills, a steam tannery, woolen mill, agricultural implement factory, good public offices, several elegant churches, a dozen mechanic shops, and numerous splendid private residences.

Auburn, twelve miles east of Russellville, on the Louisville and Memphis Railroad, is a beautiful town of eight hundred inhabitants, and contains several factories, among them a large tannery, woolen cloth mills, saw and grist steam mill, agricultural implement works, &c., &c.

South Union is a beautiful, flourishing town, on the railroad, three miles east of Auburn, inhabited by about three hundred Shakers or Quakers, who have here a society, working in common and owning everything jointly, and living as one united family.

Gordonsville, in the west part of the county, is a handsome town of three hundred inhabitants.

Adairville, on the south border of the county, on the Owensboro and Nashville Railroad, is a thriving place of two hundred and fifty population.

Keysburg, in the southwest corner of the county, has a population of two hundred and fifty, and does a large local trade.

Henryville, *Bucksville*, *Olmstead*, *Allensville*, *Baugh's Station*, *Babbittsville*, *Richelieu*, *Ferguson*, *Red River Mills*, *Whippoorwill*, and *McLeod* are all thriving, neat villages, each doing a large local trade, and the central point of a good neighborhood.

Geology and Soil.—This county lies wholly within the Lithostrotion limestone basin, known as the "barrens" of the cavernous limestones, except a small part of the southeast of the county, which borders on the Waverly series, that forms the rim of the Central Tennessee basin, and which outcrops so prominently in parts of Robertson and Cheatham counties in that State. The surface of the country is generally level, except in the northern part, which is more hilly and rocky. The level parts of the country are exceedingly fertile, although known as "barrens," an appellation given to the prairie lands lying upon the cavernous limestone formation. They were called "barrens" on account of the lack of timber, which was the result of large fires each year, that burnt the native grasses (often ten feet high) and killed the young trees. These lands produce in perfection corn, wheat, oats, rye, barley, flax,

potatoes, and tobacco. Wheat here frequently yields over forty bushels average to the acre, and tobacco over 1,000 pounds, and corn over sixty bushels. The hilly parts of the county are not near so rich, yet the valleys even here are very fertile, and the hills are well adapted for sheep husbandry and all kinds of fruit. There are no coal or other minerals in quantities sufficient for profitable working. Sulphur springs are numerous, and the water excellent for all chronic diseases.

Farms and Soil Tillage.—Before the war the farms were generally large, and in a very high state of cultivation. Farm-houses, fences, stables, yards, and lawns all exhibited a refinement of taste, and a marked appreciation of rural elegance and beauty. In the improvements, thorough tillage, fencing, and extirpation of noxious weeds and briers, the condition of the farms now does not compare favorably with that before the war. Farm-houses and barns have been greatly impaired, and much of the most valuable soil has been taxed to such a degree by *share farming*, with thriftless freedmen, or other inferior laborers, as to become almost unproductive. In consequence of this state of things, which exists more or less in all the fine tobacco-raising counties along the Tennessee border, where a large slave population was employed before the war, lands do not sell near so well as they did, and are probably cheaper, according to quality, than any in the State. Good productive lands, which were worth from \$50 to \$75, can now be bought at from \$20 to \$30, and the knob lands can be had at from \$3 to \$10 per acre. Rents vary here from \$2 to \$5 per acre. The chief crops, besides vegetables and all kinds of fruits, are tobacco, flax, corn, wheat, oats, barley, rye, potatoes, timothy, herds-grass, orchard-grass, Hungarian, millet, and Italian rye grass. These lands are probably among the best adapted in the State to receive chemical fertilizers, which will all be retained and consumed by the crops, except what may be washed into the sink-holes or basins. The deep-colored red clays, which form the subsoil of nearly all the formation, are very tenacious and well adapted as preservers of all manures put upon the surface soil, and are themselves good soil when exposed by deep plowing to the light of the sun's rays and to the winter freezes. This is one of the largest tobacco-planting counties in the United States, and one of the largest wheat and oats-producing sections in Kentucky.

Live Stock.—Good breeds of horses, mules, cattle, sheep, hogs, and poultry are to be found in Logan county; and although some of the scrub breeds are still in the country, the better pedigrees are grad-

ually gaining the ascendancy. The Quakers or Shakers are the persons who give tone to the habit of raising fine cattle, sheep, and hogs in the county, and their lists of all kinds of breeds are as thorough-bred as any in the Western country. Large droves of mules, cattle, sheep, and hogs are annually exported from this county, by rail-ways or on the hoof, to the Southern markets, as well as to that of Louisville. Poultry is raised in quantities sufficient for home use, and a considerable surplus for the markets of Nashville and Louisville. Sheep husbandry is rapidly on the increase, and, were it not for dogs, would soon be a leading industry. Labor here is rather scarce, and of poor quality. The want of good reliable labor is one of the great drawbacks to the owners of these rich lands.

Transportation Facilities.—While the streams of this county afford fine water-power for mills and factories, they are not sufficiently large for the purposes of navigation; but the Louisville and Memphis Railroad runs centrally through the county from northeast to southwest, and the Owensboro and Nashville Railroad, now under construction, centrally from north to south; so that all parts of the country is well supplied with traveling and freight facilities, both to the north and south.

Churches.—The Primitive Baptist, Reformer, Presbyterian, Catholic, Methodist, Missionary Baptist, Universalist, and Shaking Quaker are the principal religious denominations. The church buildings are, many of them, elegant, and others commodious and well built. Every neighborhood has from one to three of these buildings, with organized societies composed of intelligent, moral citizens.

Schools.—The *Bethel College*, under the management of the Baptist Conference, is a well-appointed, prosperous male institution, located at Russellville. The *Logan Female College*, at the same place, is under the patronage of the Louisville Conference of the Methodist Episcopal Church, South. It has splendid buildings, a library, and good chemical apparatus, and is largely patronized by the citizens of this and the adjacent counties. The *Browder Institute*, at Olmstead, is an excellent academy of learning, and is under the management of an able faculty, with a large number of students. There are several other high schools in the county, besides the common free schools taught under the State system, which are in operation in every district.

Domestic Arts.—The highly refined and cultivated people of Logan have ceased to manufacture home-made clothing so extensively as they formerly did; but still, in some neighborhoods, the industrious, thrifty

ladies continue to use the hand-loom, and produce fine samples of jeans, linseys, linens, and cottonades; they also traffic largely to the country merchants eggs, poultry, butter, flaxseed, feathers, maple sugar, and tree molasses. These lesser industries bring a good revenue into many families, and add much to the riches of the citizens. Few other classes of factory business are carried on; but there exist ample amounts of raw material to make this people a large manufacturing community.

LYON COUNTY.

This county was formed in 1854 from the southwestern part of Caldwell, and called in honor of Chittenden Lyon. It is bounded on the north by Crittenden and Caldwell, east by Caldwell and Trigg, south by Trigg and Marshall, and west by Marshall and Livingston counties.

Navigation and Railways.—Cumberland river runs entirely through the county from southeast to northwest, and Tennessee river passes along its southwestern border, so that no part of the county is further than from six to twelve miles of never-failing steamboat navigation, on two of the principal streams of the Mississippi Valley. The Louisville and Paducah Railroad also passes through the county from northeast to southwest, affording daily communication for freight and travel to all points South and North. No country could be better provided than this for the transportation of its agricultural and mineral wealth. Livingston and Eddy creeks are fine streams for mills and factories.

Geology, Minerals, and Soil.—This county is based almost exclusively upon the Lithostrotion limestone, except, probably, a few high hills, where the sandstone appears on the caps. The face of the country in some places is level barrens, but generally is rolling, and between the rivers hilly. The Geodiferous limestone of the sub-carboniferous period has in many places been deeply eroded, and the channels filled by drifts of cherty clay, and the finest limonite and pot iron ores. The extent of these have not as yet been thoroughly ascertained; but they are found almost everywhere over the county, in beds varying from one foot to nearly one hundred feet. The railroad cut near Eddyville, forty-

two feet deep, passes through a bed of very rich ore, for a distance of over one thousand feet, in which the ore is continuous from the top to the bottom of the cut, and how much deeper no one knows. Similar beds, some of them of much broader base, are scattered all over the county. The ores are certainly inexhaustible for hundred of years to come, and the timber for coal is first-class. Stone-coal can be had either from the Cumberland or Ohio river, or by the railroad, at as cheap a rate as can be delivered in any town in Western Pennsylvania. Large quantities of these iron ores are being shipped annually to mix with the Missouri Iron Mountain and the Michigan Lake Superior ores. The soil in all the level parts of the county is rich, and very productive of corn, oats, wheat, and tobacco. Between the rivers some of the hills are too rocky and full of iron ores to be very fertile.

Furnaces, Mills, and Factories.—One of the largest and most successful rolling-mills in the United States is that of Hillman & Sons, Empire Iron Works, of this county. The amount of iron made here in bars and boiler sheets equals that of any similar mills in the West. The character of the iron is superior to any in the United States for boilers, bridges, and all kinds of work requiring the toughest metal; even the Swedish iron is not its superior. It is said no boiler made of this metal has ever been known to burst, if the rivets were properly secured. The Mammoth Furnace, the Suwanee, Fulton's Furnace, and other new iron works, all have most excellent ore beds from which to make pig metal and blooms. There is, however, room for many more furnaces and rolling-mills, and ores enough within forty miles of fine coal beds to supply them with fuel for centuries. In Eddyville are three or four wagon and carriage shops, a large tobacco factory, woolen factory, tan-yards, and a planing-mill, grist-mill, and saw-mill, all doing well, and exporting their productions to different parts of the South and West by the railway and steamboats. At Parkersville and other places are steam grist and saw-mills, tanneries, and carriage and agricultural implement factories, &c., &c.

Timber.—Lyon county was originally very heavily timbered, and still large forests of all kinds of hard and soft wood are to be found scarcely touched by the axe. The furnaces and mills have used much of the timber close to them for charcoal and saw-logs, and thousands of hogs-head, pipe, and barrel staves are annually shipped to New Orleans to fill European orders.

Crops and Fruit.—Corn, wheat, and tobacco, the main staples, are grown by all the farmers in excess of home consumption. Rye, oats,

clover, herds-grass, timothy, orchard-grass, and millet do well, and make an abundance of hay and pasturage. The lands, when worn or tired out with any crop, can be easily renewed by deep ploughing, turning under green crops of clover, peas, buckwheat, spurry, or rye, and by using chemical fertilizers. Gypsum, German kainit, bone-dust, and salt with ashes, would be excellent fertilizers for these soils, as well as for all the other cavernous limestone lands in the State. They should be sown broadcast, just before planting the crops of wheat, corn, or tobacco, upon well-prepared ground, and then harrowed or plowed in with small plows. Peaches, apples, plums, some kinds of cherries, damsons, and pears do well, and generally yield full crops. Vineyards, so far as they have been tried, have proven a success, and the grapes are large, juicy, and well flavored. The choice varieties are the Concord, Ives Seedling, Delaware, Hartford Prolific, and other native vines.

TOWNS AND VILLAGES.

Eddyville, the county seat, is pleasantly located on the north bank of the Cumberland river, and contains about five hundred persons. It has a good court-house, four handsome churches, large warehouses and tobacco factories, wagon and carriage shops, woolen factory, tan-yard, a well-taught academy, half a dozen mechanic shops, and many neat private residences.

Parkersville, ten miles southeast of Eddyville, is a thriving town of two hundred population. It has a flourishing academy, steam mills, and several churches and mechanic shops.

Eureka, at the crossing of the railroad over the Tennessee, and *Kuttawa*, at its crossing over Cumberland, are young, growing towns, with great expectations.

Star Line Works and *Empire Iron Works* are villages doing a large local trade with the families of the workmen engaged in the iron business.

Education and Churches.—The Baptist, Reformer, Methodist, Presbyterian, Universalist, and Catholic are the principal religious denominations in the county. The churches are numerous, and generally well attended, and the people are a high-minded, moral community. The free public school system of the State has been inaugurated in every district, and a commendable spirit of schooling all the children is apparent among the parents and guardians throughout the county. The academies in Parkersville and Eddyville are under the control of well-qualified professors, who take great interest in promoting the advancement of those intrusted to their care.

Domestic Arts.—The good ladies of Lyon still practice regularly on those fine old instruments, once so popular throughout the State, the spinning-wheel and hand-loom, and manufacture every year jeans, cotton-ades, linseys, linen, blankets, counterpanes, kerseys, and other goods for home wear, and a surplus to traffic for "Sunday clothes." Butter, eggs, poultry, feathers, beeswax, ginseng, and cotton socks are sold extensively at the river towns and railroad depots.

Live Stock.—The old scrub stock is fast giving way to the newly-imported breeds of improved horses, cattle, hogs, sheep, and poultry, and within a few years fine pedigrees of every kind of stock will be generally found upon the rich farms of Lyon county.

MADISON COUNTY.

This county was cut off from a part of Lincoln by the Legislature of Virginia in 1785, and named in honor of James Madison. At present, it is bounded on the north by the Kentucky river, which separates it from Fayette and Clark, on the east by Estill and Jackson, on the south by Rockcastle and Garrard, and on the west by Garrard and the Kentucky river, which separates it from Jessamine county.

Geological Formations and Soil.—The geological formations of this county are quite varied. About two thirds of the county, which lies to the west of Muddy creek, is located on the upper Cambrian or lower Silurian rocks. These lands are rolling and hilly, or gently undulating. Then, going eastward, we find the upper Silurian, which terminates towards the border of the county (next to Estill, Jackson, and Rockcastle) in the Devonian shale, and the knobby hills and Waverly sandstones. The coal measures in this county are confined to the upper portion of the high range, known as "Big Hill," in the southern part of this and next to Jackson and Rockcastle counties, where Red Lick and Roundstone creeks take their rise. The usual shot-iron ores are found connected with the black shale formation, and the strata are similar to those in Bullitt and Nelson counties. Hydraulic cement rocks (magnesian) abound near the intersection of the upper Silurian

and Devonian series, and run through the county on a line north and south, from one to two miles west of Elliston. Near this is a tract of slashy crawfish land, based upon the ash-colored shale or black slate. The principal growth of these lands is white oak. This part of the county can be greatly improved by a proper system of under-tile drainage, and the application of chemical fertilizers—lime, German kainit, gypsum, and bone-dust. Thus treated, these will become first-class soils for all cereals and hay grasses. What are known as the “redbud lands,” near Elliston, based upon the magnesian rocks, are quite fertile, and are well adapted for corn, wheat, and tobacco. These lands seem to tire more quickly than those based upon the blue limestone, and can be easily and cheaply restored by the use of gypsum, salt, and bone-dust. The South Carolina marls also would greatly improve these soils. About Richmond, the soils are formed from the thin upper strata of the fossiliferous blue limestones, of blueish or gray tints, which are rich in potash, nitrogen, and phosphoric acid, and therefore afford by their decomposition a very productive soil. This quality of land occupies the entire western half of the county, and is peculiarly well adapted to blue-grass, hemp, corn, rye, clover, &c., &c. Taken altogether, Madison is an excellent county of lands—one of the best in the State—and susceptible of being made a perfect garden spot, wherever it is underlaid by the blue limestone formations. The small amount of white oak, black shale, and sandy soil, lying east of Muddy creek to the Estill line, produces freely corn and small grain, and can be greatly benefited by a scientific system of farming. This part of the county is peculiarly well adapted to fruit culture, and orchards and vineyards planted here, and well attended to, would produce excellent yields of fruits and berries. The best lands for orchards and vineyards are the eastern or southern exposures of the hills or ridges, where the soil is well drained and intermixed with an abundance of rich calcareous earth, which, if wanting, can be easily supplied at the time of planting the trees or vines. There are numerous springs of excellent chalybeate, salt, and other mineral waters in this county.

Agriculture.—Hemp, corn, wheat, rye, oats, barley, blue-grass, the meadow and hay grasses, and tobacco, all grow to perfection in Madison county. The hemp-growing part of the county is confined to the blue limestone lands, but the other staple crops do well in every neighborhood. Formerly hemp and tobacco were the principal branches of profitable farming; but of late years the great demand for fine horses, cattle, sheep, and hogs, and the superiority of the blue-grass pastures,

have made this one of the best stock counties in Kentucky or the West. The corn raised here contains five per cent. more strength, or carbonaceous fat-producing principles, than that grown outside of the "Blue Grass Region," and gives that much additional to the profits of stock-feeders. Here are found some of the best-blooded horses, cattle, sheep, swine, and poultry known in the United States, and no animal without an approved pedigree is considered of any great value. "Horse talk," "cow talk," "sheep talk," and "hog talk" are here (as in Fayette, Bourbon, and Woodford) considered an indispensable branch of a liberal education, and a mark of superior mental excellence. For wheat Madison county is not the equal of the "barren counties of Kentucky," such as Logan, Todd, Christian, Warren, Barren, &c., which are based upon the Lithostrotion or cavernous limestones of the sub carboniferous series, yet it produces a good average yield of wheat, which might be doubled by the proper use of chemical fertilizers, particularly superphosphates, common salt, muriate of potash, and sulphate of ammonia. A good formula for wheat land in this county would be, per acre—

Superphosphate.	150 pounds.
Muriate of potash	50 pounds.
Sulphate of ammonia	150 pounds.
Old pork-house salt	100 pounds.

Mixed intimately, and sown broadcast on well prepared land, just before seeding, and well harrowed or plowed in with light shovel plows. This formula would probably increase the yield 25 bushels per acre over the natural production, and half the proportions of these articles would increase the yield from 12 to 15 bushels per acre, or even more in dry seasons. Two hundred pounds of bone-dust and one hundred pounds of salt per acre would also be an excellent wheat fertilizer.

TOWNS AND VILLAGES.

Richmond, the county seat, is beautifully located about the centre of the county, at the head of one branch of Otter creek. It contains a population of about 2,000 persons, has a fine court-house and other public offices, six or eight handsome churches, Central University, a female academy, four banks, grist and saw-mills, planing mills, a score of mechanic shops, and numerous elegant private residences. It is at present the terminus of the Richmond Branch of the Louisville and Nashville Railroad. This road is to be continued to the Three Forks of the Kentucky river, where it will be convenient to the best iron and coal lands

in the State, which, when done, will place iron ores and coal so convenient to Richmond as to make it one of the best adapted and most desirable places for manufacturing industries to be found in the West.

Berea, fifteen miles south of Richmond, is a neat town of three hundred inhabitants. It is the seat of Berea College, a flourishing institution, patronized by children of both colors (white and black) and of both sexes.

Kirksville, ten miles southwest of Richmond, is a handsome town of two hundred and fifty people.

Waco and Elliston, with a joint population of nearly four hundred, are thriving business towns, about nine miles east of Richmond.

Kingston, eight miles south of the county seat, contains a population of about three hundred industrious, thriving people.

Boonesboro, a place noted in the annals of Kentucky as the scene of Indian fights and heroic deeds performed by the early settlers, is now a small village on the Kentucky river, near the mouth of Otter creek.

Rogersville, Speedwell, Union, Doglesville, Foxtown, Stringtown, White Hall, College Hill, Edenton, Harris Station, Duncannon, Silver Creek, Morran's Station, and Paint Lick are all neat, thriving villages, each doing a good local trade in their respective neighborhoods.

Streams.—Kentucky river, which forms the northern and part of the eastern and western boundaries of the county, is a beautiful stream, with tall cliff banks, affording a scenery equal, in many respects, to that of the Rhine or the Hudson. It can, during high water, be navigated by steamboats, and could, by the proper completion of the system of locks and dams, be made one of the most certain navigable streams in the West for steamboats of good size during the entire year. Drowning, Muddy, Otter, Tate, Silver, Roundstone, Dreaming, and Red Lick creeks, are the principal mill streams in the county, all of which flow into the Kentucky river.

Schools.—*Central University*, located at Richmond, is under the charge of R. L. Breck, D. D., Chancellor, J. W. Pratt, D. D., President, and seven assistants. It has an endowment of \$150,000, good buildings, fine laboratory and chemical apparatus, from 80 to 100 students, and brilliant prospects of future usefulness. *Madison Female Institute*, also located at Richmond, is a first-class school for girls and young ladies, and is under the able management of Professor B. J. Pinkerton and four assistants. *Berea College*, located at the town of the same name, is under the charge of Rev. E. H. Fairchild, who is assisted by fourteen

professors and tutors. This institution gives equal privileges of obtaining a liberal education to males and females of any race or color, the white and colored students being admitted and taught on equal footing. The buildings are valued at \$100,000, and the income from all sources is about \$30,000 annually. The library contains about 2,000 volumes of choice books. The number of students is sometimes several hundred. There are also several high schools and private academies in the county, and about seventy district common schools taught under the free common school system of the State, so that every child can, at very little cost, receive a good education, unless kept from school by its parents or guardian.

Churches.—The people of Madison are decidedly a moral, intelligent, church-going community. The principal denominations are the Methodist, Baptist, Presbyterian, Reformed Christian, Catholic, and Episcopalian. The church buildings are generally quite handsome specimens of architectural skill, well adapted to the purposes and needs of the Christian members, and the large congregation which usually attend with great punctuality upon each Sabbath day. These churches are located so that one or more of different denominations, or "joint churches," can be found in every neighborhood, and no family has to go very far in order to worship according to its own peculiar faith. Sunday Schools are usually attached to each church, in which the children are taught the catechism and tenets of the church of which their parents are members. The ministers are generally well educated men and good orators, properly educated in the doctrines and church literature which they are called upon to teach and explain to the intelligent people composing their audience.

Smaller Industries.—The rich lands, excellent blue-grass, and fine-blooded stock, have long since caused the people of Madison county to become too rich to card, to spin, and to weave. They find it cheaper to cultivate hemp, wheat, and corn, and to raise fine-blooded horses, cattle, swine, and sheep for market, than to employ themselves or their women in the domestic arts of making cloth. Still the industrious, energetic ladies are not idle, but work incessantly in order to excel in fine cookery, general housekeeping, and making butter, cheese, canned fruits, gardening, poultry-raising, and the management of the thousand and one household and nursery duties of the family home. And for this reason the phrase, "She is equal to a first-class Madison county wife," has as pointed a meaning in Central Kentucky as "one of the first fam-

ilies" has in old Virginia. In some neighborhoods, however, large amounts of eggs, poultry, beeswax, feathers, honey, tree syrup, and sugar are produced and traded to the country merchants. There are no large amounts of capital invested in manufacturing establishments, yet there are scattered throughout the county many fine saw and grist-mills, woolen factories, agricultural implement factories, wood-workmen's shops, various mechanic shops, and numerous actively employed carpenters, brick-masons, stone-masons, painters, and other mechanics necessary to perform the business needed by the thrifty agricultural population of the county.

The capitalists of Madison (of whom there are quite a large number for an inland agricultural community) generally employ their means in beautifying and adorning their homes, improving their lands and the pedigrees of their stock, and pleasant living and comfortable dressing, and in fine, stylish horses and handsome carriages and buggies. They enjoy life as they progress in accumulating riches, and do not seem to become grasping, aristocratic, and covetous, as are the communities in many of the large commercial centres of the world, where greater estates may accumulate, but no higher grades of human happiness or enjoyment.

In the dairy business, for which this county is so admirably adapted, but little has been done. No part of the State of New York is better suited for butter and cheese-making than Madison county, Kentucky; yet the dairy business of New York is annually \$110,000,000—nearly double all her other agricultural industries combined—while in the Blue Grass Region of Kentucky, including Madison, this branch of farming barely affords milk and butter for the citizens. That this will be changed within a few years no one can doubt who will compare the fine corn, hay, and blue-grass of this section of our State with the best dairy sections of Ohio, Pennsylvania, New York, or England.

Social Characteristics.—The people of Madison are noted for their intelligence, sobriety, education, refinement, high-toned honor, and true Kentucky hospitality. They are nearly all descended from the good old cavalier stock of Virginia and North Carolina, intermixed with many excellent families originating in England, Scotland, Ireland, or Germany. The manners of the Madisonites are open, frank, generous, and plain. They have no false pride of aristocratic birth or riches, but rank every man at his true value, as estimated by his moral character, honesty, industry, and intellectual excellence. The women are usually well educated and refined, and are remarkable for their fine health, industrious

habits, graceful bearing, and almost matchless beauty. Education is held in high esteem by all classes, and nowhere can be found a better average of well-informed men and women. This county is susceptible of sustaining a very large population of farmers, manufacturers, and mechanics; and the raw materials are so convenient, excellent, and cheap that they must bring this locality into notice with capitalists and emigrants from the Northern States and Europe, who desire profitable investments and pleasant homes. To all such we can truthfully say, that nowhere in the Western States of the American Union can be found better facilities, more advantages, and a more refined, energetic, and hospitable community than right here in the county of Madison. This county enjoys the honor of having furnished the present popular Chief Executive of the Commonwealth, the efficient acting Governor, James B. McCreary, of the town of Richmond.

MAGOFFIN COUNTY.

This county was formed in 1860 from parts of Morgan, Johnson, and Floyd counties, and named in honor of Beriah Magoffin, then Governor of Kentucky. It is bounded on the north by Morgan and Johnson, east by Johnson and Floyd, south by Perry and Breathitt, and west by Breathitt and Morgan counties.

Topography and Geology.—This county is in the central eastern part of the State, and lies in the fork of the Kentucky ridge and the Northern ridge, created by the spurs of the Cumberland Mountains. These two ridges separate at a point which marks the southern extremity of Magoffin county, and which is the beginning point respectively of Magoffin, Floyd, Perry, and Breathitt counties. From this point one ridge or spur of the mountain takes off nearly due north, or rather about north 10 degrees west, while the other (Kentucky ridge) runs northwest. The tops of these ridges form the line of Magoffin county, until they respectively reach Morgan county. This makes the county cuneiform, with Licking river running through its centre, from the starting point in the south, into Morgan on the northwest. The entire county troughs

from these two ridges towards Licking river, and presents a surface generally hilly and broken, or slightly mountainous, underlaid entirely with coal and iron ores and the rocks of the coal-bearing measures. The amount of coal and iron ore in this county is immense, and has been very little sought after. In the future history of our State, the mining industries of this section of Kentucky will become works of the first importance, and will then support a population not now even dreamed of by our most sanguine citizens. The soil along the river and creek bottoms is quite fertile, and produces excellent corn, wheat, rye, oats, and tobacco; but the hills and ridges are poor and thin, in many places rocky and less productive.

Streams.—As we stated above, the Licking runs from southeast to northwest entirely through the county, and, with its tributaries, affords excellent drainage and many fine sites for mills, furnaces, and factories. The water-fall will give good water-power. Nowhere can be found better clear streams for the propagation of the mountain trout and other game fish.

Timber.—This is one of the best timbered counties in the State, and large forests of the finest walnut, oaks, poplar, gum, hickory, chestnut, holly, and other indigenous trees, are growing in their native grandeur. These forests, as well as the coal and iron, will remain here, probably, unused, until the Licking river is made navigable by slack-water, or railways built into this part of the State.

Crops and Fruit.—Along the river bottoms large crops of corn and cereals are grown; but the great distance to market deters people from engaging in any industry that will be unprofitable for want of transportation facilities; therefore very little tobacco, hay, or flax is cultivated, although each grows well. No part of the North American continent, probably, produces more certain crops of apples, peaches, pears, quinces, cherries, plums, berries, and nuts, than this part of Kentucky. Grapes, too, here grow as finely as they do in Switzerland or in many parts of the Apennines in Europe. Vineyards and orchards can be made to pay well, and in the future will become leading industries; but at present the population is sparse, and the facilities for exportation of products are so poor, that the country cannot develop as it properly should. Lands are very cheap in price.

TOWNS AND VILLAGES.

Salyersville, the county seat, is located about the centre of the county, near to Licking river. It has a good court house, grist and saw-mills,

five or six stores, an academy, three or four churches, a dozen mechanic shops, and several neat private residences. It is the principal town in the county, has about one hundred and fifty inhabitants, and does a large home traffic.

Meadows, Licking Station, Burning Spring, and Johnson's Fork are neat villages, each doing a considerable local trade. The people are so charmed with the mountain scenery and pure air of the country, that they have no desire for the pent up, crowded thoroughfares of large cities, and therefore greatly prefer holding their residences in the woodland, near some good spring of pure water, rather than to collect in trading centres; all the towns they need they have, and are satisfied with them for the present.

Schools and Churches.—There is a good academy at Salyersville, and the free common school system of the State has been inaugurated in every district, so that schools are taught within reach of every family. The people are beginning to have more pride in educating their children than formerly, and the attendance of the children has greatly increased. The "Hard-shell" Baptist, Regular Baptist, Reformer, and Methodist are the principal Christian denominations. The church buildings in the country are generally of primitive architectural design, but not so homely or rough as to be uncomfortable, and are well adapted to the needs of the good, the pious, and faithful Christian, who depends more on faith and good works done on earth than upon fine, gilded houses, loud-sounding organs, or high-salaried preachers.

Domestic Arts.—The good, industrious ladies of Magoffin still use the cotton and wool cards, the spinning-wheels, and the hand-looms, and make large quantities of jeans, linseys, cottonade, linens, blankets, counterpanes, &c., for home use and to traffic with the merchants for "store goods" and "fashionable clothing." They also sell eggs, butter, fowls, home-knit socks, ginseng, beeswax, feathers, maple sugar, and tree molasses. The male members of the family attend to the crops of corn, potatoes, wheat, oats, and hay, and when spare hours are found (which are rarely hard to find) they enjoy the noble amusements of hunting and fishing, and seldom fail to keep the larder well supplied with the best of game, such as deer, bear, turkeys, ducks, raccoons, opossums, squirrels, birds, game fish, &c., &c. In this way they spend their lives free from the engrossing, distracting fears of financial centres, and do not suffer the equanimity of their temperaments to become disturbed by even the largest bank failures or the shortest of crop seasons.

Social Features.—The intelligent people of Magoffin county are remarkably social, kind, and hospitable, and never refuse to divide with a stranger the last piece of venison in the larder. The young people are fond of quiltings, log-rollings, house-raising, and dancing frolics, and at these gatherings they first finish up whatever is to be done, and then they set to work in real earnest to have a good old social time; the fiddle is started, and the dance, when once fairly under way, never ceases until all the young folks have become thoroughly fatigued. These frolics sometimes last for several days, the dancers going from one house to another. There is no charge for anything, but all is good humor and enjoyment.

MARION COUNTY.

This county, named in honor of Gen. Francis Marion, was taken from part of Washington county in 1834, and is bounded on the north by Washington, east by Boyle and Casey, south by Taylor and Larue, and west by Larue and Nelson counties.

Topography, Geology, and Soil.—Marion county lies about seventy-five miles to the southeast of Louisville, and at the lower or southwestern limit of the "Blue Grass Region" proper, and is very much diversified in its surface and geological features. The most abrupt changes of rocks and soil occur in consequence of the overlapping of the different geological formations, even on the same hill-side. This is particularly the case about Bradfordsville, and in the vicinity of New Market and Raywick. Lebanon stands on the verge of the blue limestone formation, the upper beds of which are exposed in the hollows; the overlying rocks of the upper Silurian are quite thin, and quickly pass into those of Devonian date. The magnesian limestone and the hydraulic limestone lands often have a good red or mulatto subsoil, which is quite rich in the oxides of iron, lime, magnesia, and potash, and which will bear subsoiling to great advantage. The black shale is nearly fifty feet thick at the base of the "knobby hills," and is accompanied by bands of iron ores similar to those of Bullitt and Nelson counties. There is also a strata of ash-col-

ored shale, and several others of marly lime and sandstone, which will some day be valuable as fertilizers. Muldraugh's Hill, a ridge extending from the mouth of Salt river, southeastwardly through Kentucky, presents the curious spectacle of a continuous level or rolling surface or plateau, all lands to the south and west of which are based on the Waverly and sub-carboniferous rocks, while to the north and east is a sudden fault or falling off of from two to five hundred feet. This peculiarity, doubtless, was caused by the upheaval of the sub-carboniferous rocks on the southward, or the subsidence of the Silurian rocks on the north-eastward of the axis now marked by the Rolling Fork of Salt river. The soil of Marion is, of course, as diversified as the subjacent rocks, being rich and fertile, or thin and unproductive, according to the outcropping strata. The "sobby beech lands," which lie near the base of the "knobs," can be greatly improved by tile-drainage and the application of lime, kainit. superphosphates, gypsum, and marls.

Agriculture.—Corn, wheat, rye, oats, and tobacco are the staple crops. Some hemp, flax, and potatoes are cultivated, but only to a limited extent. Blue-grass grows finely on the blue limestone and magnesian lands, and excellent hay is made from timothy, herds-grass, orchard-grass, clover, Hungarian, and millet, all of which are well adapted to this climate and the soils. The hilly broken lands of the knobs, and of Muldraugh's Hill, are peculiarly well suited for orchards and vineyards. Peaches rarely ever fail of a good crop. The native vines, such as the Concord, Ives Seedling, Catawba, Delaware, Hartford Prolific, &c., &c., will produce often over ten thousand pounds of good, luscious berries per acre, from which seven to eight hundred gallons of well-flavored wine can be expressed. It would be well if more attention was paid to grape-culture throughout the State, but particularly in the hilly and mountainous sections. In the article on Washington county the process of wine-making is given, which the reader will find applicable equally to Marion and many other parts of the State.

Live Stock.—The better breeds of all classes of live stock are to be found in this county, although in some neighborhoods the "scrubs" are still popular, under the idea which the farmers have that they are hardier, and can make their own living in the range. Large numbers of mules are annually sent from this county to the markets of the cotton States, and many fine trotting and racing horses are sold in the Northern and Eastern cities, natives of this section of Kentucky. Sheep do well throughout all the "knobby hill country," and, owing to the many bitter shrubs and weeds, seem to flourish far better than in the Blue Grass

country proper. The Cottswold and Merino are the favorites for wool, and the Southdown for mutton.

TOWNS AND VILLAGES.

Lebanon, the county seat, is handsomely located at the head of Hardin's creek, directly on the Knoxville Branch of the Louisville and Nashville Railroad. It contains a population of about twenty-five hundred persons, has ten to twelve elegant churches, two large female academies, and several private schools, saw and grist-mills, woolen factory, some twenty mechanic shops, and many costly private residences.

Bradfordsville, nine miles east of Lebanon, is a place of considerable business, and contains about two hundred inhabitants.

New Market, on the Rolling Fork, five miles south of Lebanon, is a flourishing town of some one hundred and eighty population.

Raywick, also on the Rolling Fork, is quite a handsome business town of some one hundred and seventy-five inhabitants.

Chicago, situated on the Knoxville Branch Railroad, has about one hundred and fifty inhabitants, and is quite an extensive shipping point.

St. Mary, on the same railroad, and near St. Mary's College, is a beautiful town of one hundred and twenty-five inhabitants.

Loretto, on the same railroad, near Loretto Academy, is a handsome town of about fifty inhabitants.

Ryley's Station, *New Hope*, *Penicks*, and *Rolling Fork* are small, thriving villages.

Transportation Facilities.—There are no navigable rivers, but several streams which afford good mill-sites, with fine water-fall. The Lebanon or Knoxville Branch of the Louisville and Nashville Railroad passes centrally from west to east through this county. The Cumberland and Ohio Railroad, now in process of construction, is located to pass centrally north and south through the county, and there is also a charter for a road to connect the town of Lebanon with Lexington, Kentucky.

Churches.—The Catholics are the most numerous in the county. They have several elegant church buildings, and female and male academies and schools. The Methodists, Baptists, Episcopalians, Presbyterians, and Reformers also have good church buildings and large congregations. The citizens of Marion are emphatically a moral, church-going people.

Schools.—St. Mary's College (Catholic), located near the town of the same name, has ten professors, a good library and chemical apparatus, and about one hundred students. The Loretto Academy (Catholic),

near the town of the same name, is an excellent institution, well patronized by the citizens of this and adjoining counties. There are two well-managed academies in Lebanon, and several private high schools in different parts of the county. The free public schools are also taught in nearly every district.

Domestic Arts.—In many neighborhoods the people still have their every-day clothing manufactured on the old-fashioned hand-loom, and large numbers of chickens, turkeys, ducks, guineas, and eggs are sold to the hucksters, who come to the railroad depots from Louisville. There are also traded to the merchants quantities of dried fruit, feathers, beeswax, maple sugar, tree molasses, and ginseng. Tan-bark and wagon and plow timbers and staves are exported largely by the railroads. The class of whisky known as "Nelson County" is extensively manufactured in Marion and the adjoining counties.

The People.—Nowhere in Kentucky can be found a more intelligent, industrious, kind, refined, and hospitable population than in Marion county. They know well the fine outcome of their rich lands and iron ores and hard timber and superior live stock; and they are anxious to have immigrants from other States or Europe to come and settle among them, and aid in developing their resources, and will give to all such a hearty welcome.

MARSHALL COUNTY.

In the year 1842 this county was cut off from the northern part of Calloway, and named in honor of Judge John Marshall. It is bounded on the north and east by the Tennessee river, which separates it from the counties of Livingston, Lyon, and Trigg, on the south by Calloway, and on the west by Graves and McCracken counties.

Topography, Geology, and Soil.—Marshall is located in "Jackson Purchase," west of the Tennessee river, and in the southwest part of the State. The entire area is quaternary, and presents a very curious geological formation when compared with that country lying immediately east and across the Tennessee river, as seen in the counties of Livingston,

Lyon, and Trigg. At a very recent geological period, all of that part of Kentucky west of the Tennessee was an arm of the Gulf of Mexico, which then extended far northwards into the very heart of the Mississippi and Ohio Valleys. The immense beds of marine deposits, such as oyster-shell, shark's teeth, corals, marls formed of the remains of the sea-cows and shell-fish, and the sandy strata terminating with loess or silt, prove the undoubted presence of a salt ocean when these deposits were made numberless ages ago. Altogether, it is one of the most interesting exhibitions of geological changes to be met with in the United States, marking the period when mighty continental changes were effected, and when gradual elevations caused the ocean to withdraw and give place to the great system of rivers that now drain the central valleys of the North American continent.

The shore of this ancient ocean was the margin of the Tennessee river, from its mouth to the Muscle Shoals in Alabama. Along this old shore line we find the western boundary of the limestone rocks, slates, and sandstones belonging to several different formations, the lowest being the Silurian; but the major part being the sub carboniferous and overlying sandstones of the mill grit or conglomerate series. On the west of this shore line in Marshall, Calloway, and the adjacent counties, we have beds of laminated sand, showing many clayey seams; then above these are formations of clayey materials, intermixed with sand, fossil shells, and marly substances, through which have percolated iron dissolved in water. Some of the sands are green, some white, some vermillion, and some red. The green sands are so filled with marly matter as to become good fertilizers, being connected closely with the cretaceous formations.

The surface soil is generally a rich vegetable black mould, underlaid with a red or chocolate-colored clay, sometimes, but rarely, gravelly or sandy. The general appearance of the country is level or gently rolling, except where it, from want of proper drainage, is inclined to be swampy. The bottom lands are exceedingly fertile, and the uplands, when not too sandy, cultivate very freely and light, and produce good crops of cotton, tobacco, vegetables, cereals, and fruit. The swamp lands, if properly drained with tiles, could be made the most productive of any in the country. Lignite is found at varying depths all through this formation, and also a conglomerate iron and sandstone, formed by the dissolved iron, which become cemented with the sand; but neither this "cement stone" or the lignite (which is often mistaken by the igno-

rant for true stone-coal) are worth mining for fuel or metal. There are numerous mineral springs, which are said to be of excellent water.

Agriculture.—Tobacco is here *king* of crops; but corn, wheat, oats, cotton, rye, flax, and all the hay grasses do well, and are mainly cultivated for home consumption, or to be fed to stock, which are fattened and sold on the hoof. The class of fine manufacturing and shipping leaf tobacco raised in Marshall, and sold in Paducah, tends largely to give character to that important market. Large numbers of hogs and mules are every year fattened and driven to the Cotton State markets. The breeds of live stock have not been much improved, the old "scrub stock" still holding a prominent position in the minds of the farmers, because, as they say, "these can make their own living in the wild range."

TOWNS AND VILLAGES.

Benton, the county seat, is eligibly located near the centre of the county, on the south side of Clark's river. It contains about two hundred inhabitants, has a good brick court-house, and other public offices, two churches, a tannery, grist and saw-mill, cotton gin, woolen factory, half a dozen mechanic shops, and several handsome private residences.

Birmingham, on the Tennessee river, has about four hundred inhabitants, several wood factories, mills, and tobacco stemmeries, and is a place of considerable importance as a shipping point.

Calvert City, in the northern part of the county, on the line of the Elizabethtown and Paducah Railroad, has about three hundred inhabitants, and does a large shipping and local trade.

Aurora, Fair Dealing, Brewer's Mill, Olive, Palma, Exchange, Patterson's Landing, Oakland, Henderson's Mills, and Briensburg are all neat villages, each doing the necessary traffic in the neighborhood in which it is located.

Churches.—The Old Baptist, the Methodist, Catholic, Presbyterian, Missionary Baptist, Reformer, and Episcopalian are the principal Christian denominations. The church buildings, without being very fine, are generally good, substantial, and commodious, and well suited to the wants of the people, who are plain, industrious, intelligent, enterprising, and moral.

Schools.—There are several private schools and academies in the county, in addition to the free public schools taught under the State system in every district. The citizens know the necessity of having their children educated, and show a commendable zeal in having them

attend the public schools, and receive all the advantages which can be obtained thereat.

Forestry.—There are in Marshall large groves of the finest cypress, oaks of all kinds, poplar, hickory, pecan, cottonwood, cherry, walnut, beech, birch, box elder, linden, chestnut, mulberry, hackberry, sassafras, gum, cucumber tree, elm, sugar maple, &c., &c., all as yet untouched comparatively by the woodman's axe, although much timber, both sawed and in logs and staves, is exported every year.

Crop Rotation and Green Crops.—The peculiarity of the geological formation makes it absolutely necessary that the people of this section of the State, in order to keep up the natural fertility of their lands, should have a skillful rotation of crops, and also should plow in green crops of clover, buckwheat, peas, and rye, as well as to use such chemical fertilizers as experience will prove to be beneficial. The intelligent farmers, after a few experiments, will better understand how to use these fertilizers.

MARTIN COUNTY.

This county, the last formed in the State, was taken in 1870 from parts of Pike, Floyd, Johnson, and Lawrence, and named in honor of Col. John P. Martin. It is bounded on the northwest by Johnson and Lawrence, northeast by the State line of West Virginia, south by Pike and Floyd, and southwest by Floyd county.

Topography, Geology, and Soil.—Martin is located in the east and central portion of the State, immediately on Tug river, which is the north or main branch of the Big Sandy. The entire county is hilly and mountainous, and is based upon the true coal measures of the East Kentucky coal field. Coal and iron ores abound, and forests of the finest timber cover the country in all the majesty of their primitive grandeur. There are numerous springs of salt and mineral waters, said to be of most excellent quality. The salt springs have been partially utilized, and some salt exported; but as yet the country is almost entirely undeveloped, so far as regards its deposits of iron ores, coal, timber, and min-

eral waters. The soil along the river and creek bottoms is very rich and productive, though the ridges and hills are rocky, and less adapted to agricultural purposes. The soil, however, is well suited for vineyards and orchards, and has no superior for sheep husbandry.

TOWNS AND VILLAGES.

The good citizens of Martin are not given to the habit of gathering into cities or large towns, but rather prefer the health-giving atmosphere of the country, and the pure water and exhilarating influences of mountain scenery; therefore, we find *Warfield*, the county seat, to be the only place of importance in this section, excepting the neat, flourishing village of *Inez*. The combined population of these places will not exceed two hundred and fifty persons, who are engaged generally in doing the necessary traffic of the county, and supplying the people with the dry goods, ammunition, and the groceries needed in the county. If ever the emergency should arise in this section of the State that requires larger towns or cities, Martin, through its rich beds of iron ores, coal, timber, &c., will be abundantly able to support them, although for the present there is no such state of case, and consequently the population is almost entirely rural.

Schools.—Mr. T. W. Newberry, the efficient school commissioner of this county, says: "We have no institutions of learning but those under the immediate supervision of the common school laws of Kentucky. Our schools are in a much better condition than before the organization of the Teachers' Institute. They are now progressing very satisfactorily, and considerable interest is manifested by both teachers and pupils."

Churches.—The Primitive Baptist, Methodist, Free-will Baptist, Presbyterian, Reformer, and some Episcopalians, are the principal religious denominations. The church buildings are not elegant, but are made of the native logs and boards, after a style of architecture that does more credit to the good intentions of the worshipers than the skill of the workmen. In these rural buildings are congregated the honest, devout seekers for truth, who are firmly impressed with the good old axiom, "love thy neighbor," and also with a faith that good works are to be reckoned as sources worthy of reward, rather than fine, hollow speeches and magnificent apparel, or gilded churches.

Small Industries.—There are no large factories or extensive capitalists in this county; but those smaller industries, carried on by the noble, energetic women, who spin, weave, and sew for the benefit of the families, are plentiful in every neighborhood. The spinning-wheel, the

warping-bars, and the loom, are seen at every house, and the maids and matrons know well how to use them. Nearly all the every-day wear is manufactured at home from the cotton, flax, and wool produced on the farm; besides which, a great amount of cloth is traded to the local merchants and peddlers. The females also traffic extensively to these merchants eggs, poultry, feathers, beeswax, ginseng, butter, maple sugar, and tree syrup, for which they obtain all kinds of dry goods and groceries needed for family use.

Peculiarities of the People.—The citizens of Martin love their rivers, their creeks, their mountains and hills, with a fervency that shows them possessed of the highest patriotism known to man. They are also exceedingly hospitable and kind to strangers, and a traveler here will always find the string of the door-latch hanging on the outside as a token of welcome. The men delight in hunting and fishing, and have much enjoyment at every season of the year in chasing the wild deer, the turkey, the bear, the fox, &c., which are still plentiful; and also in imitating the example of Izaak Walton; and they never fail to take home a splendid string of perch, salmon, or mountain trout, when the water is in proper stage for the fisherman. Every neighbor feels under obligations to help every other one to build his houses, fence his lands, clear off the deadening, to aid at the quiltings, and dance at the frolics, and if one meets with an accident by fire or otherwise, all hands assemble at once and repair the damage. There is no foolish, selfish pride of birth or wealth, but every one is judged and promoted according to his intelligence, moral rectitude, and industry. In such a community it is most pleasing to live, and a good man is long remembered by his friends and neighbors after he dies.

The Future.—When the capitalists of the country shall, at some future day, discover the great richness of the mountain counties of Kentucky in iron ores, coal, timber, and rich lands, so peculiarly adapted for the cereals, vegetables, vineyards, orchards, and stock-raising, then will a tide of immigration pour into this section, such as would “astonish the natives,” and such as will change rapidly the characteristics of the population. The State will then become richer, but I doubt whether the people will be happier, or more moral or virtuous than they are to day.

MASON COUNTY.

This county was established by the State Legislature of Virginia in the year 1788, and named in honor of George Mason. It was taken from a part of Bourbon, and originally embraced all the country lying north and east of Licking river, from its mouth to its source; thence, all the territory north of a direct line to the nearest point on the Virginia State line, opposite Russell county of that State. Being the 8th county formed, it contained nearly one fourth of the territory of the State. This has been lopped off in the formation of other counties, until now Mason has not more than 225 square miles. It is at present bounded on the north by the Ohio river, which separates it from Brown and Adam counties, Ohio, on the east by Lewis, south by Fleming, and west by Robertson and Bracken counties.

Geology and Soil.—Mason is located entirely upon the upper Cambrian or lower Silurian limestones. The surface is generally undulating, though in parts it is quite uneven, hilly, and broken. There are no minerals worth mining in this county, although traces of shot-iron ores and lead may exist here, as in all the adjacent blue limestone counties. There are many strata of fine building stone in almost every part of the county, and also marlites, which can be made of great service as a fertilizer in restoring the potash and lime needed in the worn tobacco soils. Tobacco (being a great feeder, particularly on potash, lime, and the nitrates) exhausts lands very rapidly, unless the elements used are placed back every year, so as to keep the soil in good heart. The true blue-grass and hemp-producing soil of the State is only found based upon the blue limestone formation, and certain strata of this are vastly superior to some others in the same series. Mason county is particularly fortunate in having these better strata composed of calcareous matter and fat marls at the surface; therefore, we here find blue-grass and hemp lands not surpassed by any in the world. When worn, these lands can be easily restored by the judicious application of chemical fertilizers. Nowhere, except along a small strip of country next to Lewis county, do the upper Silurian rocks come to the surface; therefore, all of Mason county may be classed as good productive grass, hemp, and tobacco lands. The nitrates and lime abound most in the west of the county next to Bracken, which is the cause of the soil in that section being so superior

for the fine quality of tobacco, known to the trade as the "Mason County Wrapping Leaf."

Agriculture.—The principal staples of this county are hemp, corn, tobacco, wheat, oats, barley, rye, and live stock. For fifty years Mason tobacco has ranked among the best produced in the United States, and has been the source of great profit to the farmers of this part of Kentucky. The cereals grow to perfection, while the hemp compares favorably with any crop produced in Fayette, Bourbon, or Woodford. In vegetables and small fruits, no part of the State excels this county. In vineyards and orchards, Mason is the peer of any county in the Ohio Valley. The excellent quality of the corn and blue-grass naturally forces this to be a leading stock county; and here are found the best breeds of racing and trotting horses, Short-horn, Alderney, and other noted cattle, Cottswold, Shropshiredown, Merino, and Southdown sheep, red and black Berkshire, Poland-China, Essex, Chester White, and other famous breeds of hogs, and the best kinds of poultry and other quadrupeds or birds raised on the farm. The people are devoted to the production of fine stock, and a part of a liberal education here consists in being able to talk of the good points and pedigrees of horses, cattle, sheep, swine, &c., just as the merchants of a commercial city speak of the laws of trade, or the scientists of the laws of nature.

TOWNS AND VILLAGES.

Maysville, the county seat, is beautifully located on a high plateau, at the mouth of Limestone creek (see article on Cities and Towns), and contains a population of some six or seven thousand souls. It has a fine court-house and other public offices, is handsomely and compactly built, has over a dozen elegant churches, five academies or seminaries, several private schools, good public city schools, steam saw and flouring-mills, planing mills, agricultural works, cotton factory, chair factory, piano factory, foundries, breweries, tobacco factories, car-shops, pork-packing establishment, scores of mechanic shops, and numerous costly and tastefully arranged private residences. It is well located for a large commercial and manufacturing centre. The Lexington and Maysville Railroad gives it easy communication with all parts of the State.

Washington, the original county seat, three and a half miles from Maysville, on the turnpike leading to Lexington, has a population of about three hundred.

Mayslick, twelve miles from the county seat, has two hundred and fifty inhabitants, and is quite a pretty, thriving village.

Dover, eleven miles below Maysville, on the Ohio river, is a place of considerable importance as a shipping point, and is noted for its large tobacco factories. It contains a population of about six hundred.

Minerva is a beautiful village, ten miles from Maysville, containing about two hundred people.

Germantown, a handsome business town of nearly five hundred inhabitants, is located immediately on the line between Mason and Bracken counties.

Sardis, fourteen miles southwest of Maysville, has a population of nearly two hundred persons, and does a large trade.

Leesburg, about the same size, is seven miles from Maysville, on the turnpike leading to Flemingsburg.

Helena, *Mount Gilead*, *Humphreysville*, *Orangeburg*, *Rectorsville*, *Springdale*, *North Fork*, *Shannon*, *Slack*, and *Fern Leaf* are all neat, thriving villages, with populations varying from 25 to 100 persons.

Streams and Railroads.—The beautiful Ohio river affords navigation for steamboats for every neighborhood in the county, while its tributaries, Bull, Cabin, Kennedy, Beasley, Limestone, and Lawrence creeks, give good drainage and water-power for mills to that part of the county inclined towards that river. The southern part of the county is drained by the north fork of Licking and its tributaries, Mills, Wells, Lee, Shannon, and Bracken creeks, which also afford good mill-sites. The Maysville and Lexington Railroad runs from Maysville south, centrally through the county, and gives easy traveling and freight facilities to all parts of the county lying off from the Ohio river. Other roads are in contemplation, which, if built, will make Mason the peer of any other county in the State in railway advantages. All the roads and highways are well macadamized.

Schools and Churches.—Besides the high schools and academies in Maysville, there are several seminaries of high standing in the other towns, besides free public schools taught in every district under the State system. No county in the State more generally educates her children than Mason, and in no section is there a higher grade of scholarship to be found in the schools and academies. The people are well convinced of the great importance of general education, and show a commendable zeal in having their children well instructed. The Presbyterian, Baptist, Methodist, Episcopalian, Catholic, Reformer, Luthe-

ran, and Unitarian are the principal Christian denominations, all of which have fine church buildings and large, devout congregations throughout the county. No part of the West is more free from sectarian prejudices, and more tolerant upon doctrinal points, than the religious element of this section of our State. The clergy are usually highly educated, polished orators, who are deservedly respected for their piety and excellence in moral teachings, and generally provided with comfortable salaries.

Domestic Industries.—The people of Mason, owing to their fine lands, excelling in grass and corn, and superior breeds of live stock, have long since become too rich to manufacture much cloth upon the old-fashioned spinning-wheels and looms. But still they are not entirely without home productions of the lesser industries, as we find them supplying the markets of Cincinnati, Newport, and Covington with large shipments of butter, poultry, eggs, fruits, feathers, beeswax, honey, flax-seed, dried fruits, maple sugar, and tree molasses. Market gardens, orchards, and vineyards are becoming more common; and a subdivision of the lands into smaller farms every year increases the tendency towards a new system of mixed farming, which bids fair to greatly increase the profits of the farmers.

Social Characteristics—The people of Mason are nearly all of the good old Virginia stock, intermixed to a certain extent with the best races of Great Britain and Europe. We accordingly find here that general intelligence, high-toned honor, chivalrous hospitality, and liberal ideas that so distinguish the Southern and Western gentlemen in every part of our country. The ladies, too, are well educated, refined, and accomplished, and in every way equal to any of their sisters in the United States. They are also noted for their business qualifications as house-keepers, and for their practical powers in the management of the affairs of the family home. No people live better, or dress more comfortably, or know better how to entertain strangers who may be visiting among them. Emigrants from other countries, seeking good homes, cannot find a better soil, a more hospitable people, or a more intelligent community than in Mason county.

What is Needed.—Much of the virgin soil has been washed from the hill sides of this country, and now lies in a perfect state of quietude at the bottom of the Gulf of Mexico. The continual carelessness in crop cultivation has caused a lessening of the amount of plant food available in the dirt lying nearest the surface. These drains should be guarded

against by the skillful scientific farmer, which can be easily done by his learning the use of tile-drainage, and the method of applying *properly* chemical fertilizers. I hope every farmer will read the article on fertilization of lands, and practically experiment for his own satisfaction and profit. *Another need* to the citizens of Mason county is to imitate Ohio, New York, Pennsylvania, and England in putting everything made on the farm into the shape of carbon or fat before it is sold from the lands. This can be done by selling all the hay and grain the shape of first-class beeves and sheep, and all the grass in butter and cheese and milk, condensed so as to bear transportation. Dairying ought to be introduced, and to become the *leading industry* of the county; and from this source, not less than half a million of dollars per annum should come in for distribution among the citizens. See article on Dairying.

McCRACKEN COUNTY.

In 1824 this county was formed out of a part of Hickman, and named in honor of Capt. Virgil McCracken. It is located in the "Kentucky Purchase," in the extreme western part of the State, on the Ohio river, below its junction with the Tennessee, and is bounded as follows: north and northeast by the Ohio river, which separates it from the State of Illinois, and by the Tennessee river, which separates it from Livingston county, Kentucky, east by Marshall county, south by Graves, and west by Ballard county.

Geology and Soil.—All the territory west of the Tennessee river, in Kentucky, is in the quaternary formation, except small areas in Calloway and Marshall counties. Consequently, there are no rocks to be found, and no metals in quantities sufficient for profitable working. There has been formed (and is still being formed by the filtration of chalybeate waters through the sand which underlies the loams and marls of this section of country) a ferruginous conglomerate, known as "cement rock" or "iron sandstone." This conglomerate outcrops in many places along the banks of the rivers and creeks, and is met with almost every-

where in digging wells. Lignite, formed of timber trees, unlike the vegetation that formed the true coal of the coal measures, is met with everywhere in the "Purchase," in layers varying from a few inches to three or four feet in thickness. This lignite has often been mistaken for bituminous coal by persons ignorant of its true nature. It burns tolerably well, but does not contain a sufficiency of carbon to make it worth mining. Chalybeate waters are very common, varying greatly in strength and ingredients, and in many localities are resorted to by invalids for chronic complaints, chills, dyspepsia, &c. The country is generally level, and much of it prairie. The soil is mostly a fertile loam, underlaid with red or yellow clay, which in turn rests on beds of sand, at a greater or less depth from the surface. The lands produce good corn, wheat, oats, flax, rye, and tobacco, and grow well most grasses used for hay, such as orchard-grass, redtop, timothy, Italian rye grass, lucern, clover, Hungarian, and millet. White clover is indigenous.

Crops and Fruit.—As we have just said, these lands produce well all the cereals and the grasses to perfection, except blue grass, which wants a blue limestone soil. The tobacco of this section is very superior, either for shipping leaf or manufacturing purposes. For bright wrappers and fillers the Paducah market, in this county, supplies much of the finest grades sold in the West. The corn and wheat crops rarely fail of a full average, and are mostly made into meal and flour, and shipped South, or are fed to hogs, which are sold fat or in pork. Fruits of all kinds do well, and the peaches raised on these lands are as finely flavored as any grown in the United States. Grapes do well on the hills.

Streams and Timber.—Besides the Ohio and Tennessee rivers, there are several fine mill streams in the county, the principal of which are Clark's river, Island creek, Mayfield, Massac, Willow, Newton, and Perkins creeks, West Fork, and Spring Bayou. On the river and creek bottoms, and also on much of the rolling lands, the timber was originally very thick and large; but much of this has been used up for fencing and building, and by deadening and fire. A very large amount of sawed lumber, staves, and logs have also been shipped by way of New Orleans to European countries.

CITIES AND TOWNS.

Paducah, the county seat, is a city of about twelve thousand inhabitants, situated immediately at the junction of the Tennessee with the Ohio river. It is the largest city between Louisville and the mouth of the Ohio river, except Evansville, Indiana, and contains all kinds of

factories, churches, public buildings, fine residences, mills, mechanic shops, &c., &c., usually found in a city of from ten to twenty-five thousand people. It is the terminus of two very important railroads—the Louisville and Paducah and the Paducah and Gulf Railroads. She is destined to become a very large commercial centre, and has already gained the appellation of “the growing city of Southern Kentucky.”

Wilmington, the former county seat, *Belgrade*, *Fersey City*, *Norton's Bluff*, *Woodville*, *Gum Springs*, *Florence*, *Colliersville*, *Massac*, *Bonds*, and *Maxton's Mills* are all thriving villages, each doing a large local trade.

Mills and Factories.—The city of Paducah contains a large number of different kinds of factories, among them grist and saw-mills, iron rolling-mills, railroad machine shops, woolen and carding-mills, tobacco warehouses, factories, and stemmeries, pork and lard factories, wagon factories, agricultural implement factories, furniture factories, potteries, &c., &c. In the county also are many grist and saw-mills, tobacco factories, and smith and wood shops, each doing a large and profitable business. There is still room here for many more establishments of various handicrafts, the raw material for which is here in profusion and cheapness, and a wide expanse of markets, both south and west, for their products. (See chapter on Cities and Towns.)

Live Stock.—While the farmers have been too closely engaged in the never-ending cultivation of tobacco to pay much attention to blooded stock, yet some few wide-awake, far-seeing, public-spirited men have brought into the county good breeds of horses, cattle, sheep, and hogs, until now many neighborhoods can boast of good pedigrees of each of these classes of animals. In other neighborhoods the original scrub stock of the country still contends for mastery. Hogs are improved more than any other class of animals, and are more profitable to farmers, from the early age at which they can be fattened and put into market. A large number of mules also are being raised each year for the Southern markets. In the early settlement of the country bees were numerous, and the bee trees of the forests supplied a sufficiency of honey for the use of nearly all the families in the county. The farmers now keep enough of these industrious insects for home purposes, and have an abundance of honey at little or no expense. Poultry of all kinds are easily raised, and are exceedingly productive to the farmers' wives.

Schools.—There are several excellent academies (male and female) in Paducah, under the superintendence of able professors. The public

schools of the city are in most excellent condition, and afford the very best facilities to all children to become well educated. The State common free school system extends to every district in the county, and the people take a commendable pride in seeing that their children receive all the benefits that may accrue at these institutions.

Churches.—The Catholics, Presbyterians, Episcopalians, Methodists, Baptists, Reformers, Unitarians, and Lutherans, all have fine churches in Paducah, and different parts of the county, where large congregations meet, and regular exercises and Sunday Schools are held every Sabbath.

Smaller Industries.—Farmers' wives and daughters living near a city nearly always give up the good old fashion of carding, spinning, and weaving, and those near Paducah are no exception to the balance of their sisterhood; yet they have substituted vegetable gardens, dairies, and fruit and berry orchards, until now they make more money from these than was formerly made from their traffic in home-made cloth, home-knit socks, and beautiful counterpanes and quilts. The garden and orchard farms of this county are becoming quite valuable, and scores of families make fortunes by supplying the market with poultry, eggs, honey, vegetables, early fruit, berries, milk, and butter. There is still room for much more of this kind of farming, and the demand for articles of these smaller industries will continue to increase as the towns and cities grow. One hundred years ago the non-producing or consuming classes in the United States formed only one eighth of the population, now it forms nearly sixty per cent., and is still increasing, as compared with the farming or producing classes of people.

Social Characteristics.—There is no part of the West where the people are more intelligent, energetic, and industrious than in Paducah and McCracken county, and no place where better morals, more liberality, good fellowship, and hospitality exist. Here every one is considered a gentleman, and is so received and judged according to his behavior, morality, and intelligence. There is no aristocracy of birth or riches, genuine worth alone being the lever that lifts every person to prominence of honor, wealth, or political position. The climate is excellent, living cheap, and every article convenient for manufacturing purposes, or for the needs of families, who labor apart from the farms, at mechanical trades, or mercantile industries, or the professions. The citizens live on rich food, dress well, and are contented and happy, enjoying a good government and low taxes, without any religious or political fanaticism.

McLEAN COUNTY.

This county was formed in 1854 out of parts of Daviess, Ohio, and Muhlenburg counties, and named in honor of Judge Alney McLean. It is situated on each side of Green river, and is bounded on the north by Daviess, east by Ohio, south by Muhlenburg and Hopkins, and west by Hopkins, Webster, and Henderson counties.

TOWNS AND VILLAGES.

Calhoon, the county seat, is handsomely located on the north side of Green river, a little way above lock No. 2. It contains about 1,000 inhabitants, has a good court-house and other public offices, three or four elegant churches, a grist and saw-mill, woolen factory, several tobacco factories, machine-shops, a half dozen mechanic shops, and many neat, well appointed private residences.

Rumsey is located on the south side of the river, opposite to Calhoon, at lock No. 2, has a population of three hundred, and is the shipping point for a large section of the adjacent country.

Livermore, a thriving town of four hundred inhabitants, is located on the north side of Green river, at the crossing of the Owensboro and Nashville Railroad.

Sacramento, a remarkably handsome town of two hundred and fifty inhabitants, is situated in a rich section of the country, ten miles southwest of Calhoon.

Wrightsburg, *Beech Grove*, *Daviessville*, *Bellview*, *Worthington*, *Bremen*, *Livia*, *Riley's Station*, *Tichenors*, and *Island Station*, are all neat, thriving villages, each doing the local business of their respective neighborhoods.

Commerce and Navigation.—The Owensboro and Nashville Railroad, which is completed from the Ohio river to the junction with the Louisville and Paducah Railroad in Muhlenburg county, runs from north to south through the eastern part of McLean county, and gives daily communication with the Ohio river at Owensboro with the entire Western and Southern country, and through the railway running from Louisville to Paducah and its connections. The locks and dams on Green river render that stream navigable the year round for steamboats, so that every part of this county lies convenient for the shipment of its productions to the various markets of the Ohio Valley. Large quantities of

tobacco, corn, oats, and live stock (particularly mules and hogs) are exported every season, which, as a productive surplus, bring revenue to the farmers and traders of the country.

Geology and Soil.—This county lies altogether upon the true coal measures of the West Kentucky coal field, and consequently has beds of excellent bituminous coal in every part of its territory. Iron ores, such as are found in Muhlenburg and Hopkins counties, also exist in quantities in this county, though they have never as yet been utilized. Between Cypress creek and Green river, from the edge of Muhlenburg county on Green river to the mouth of Pond river, is a large tract of country known as the "Green River Flats." A similar class of lands also is found along the Green river bottoms, on the north side, throughout the entire extent of the county. These lands are very level and flat, interspersed with bayous or creeks and lagoons, and abound in the largest growth of cypress, gum, poplar, white oak, overcup, and other forest trees, some of which often measure from five to seven feet in diameter. When high enough for cultivation, the lands are wonderfully productive, particularly for corn and the hay grasses. A thorough system of tile-drainage would make these lands exceedingly valuable, and will some day render them the garden spot of this section of Kentucky. The surface of the highlands is generally rolling, but sometimes quite level for hundreds of acres in a body.

Timber.—McLean is one of the best timbered counties in Kentucky, and abounds in forests of excellent cypress, poplar, gum, all kinds of oaks, hickory, pecan, honey locust, walnut, butternut, ash, sugar-tree, maple, wild cherry, cucumber tree, wahoo, ironwood, linden, cottonwood, sycamore, beech, birch, hornbeam, sassafras, box elder, &c., &c., with excessive undergrowth of dogwood, spicewood, all sorts of vines, briars, cane, wild peas, &c. Immense quantities of staves, logs, and sawed lumber have been exported for fifty years to all parts of the South and West, and to Europe; and still the forests are apparently as well filled with timber trees as they were a quarter of a century ago.

Agriculture.—Tobacco and corn are the *kings* of the staples in this county, although large crops are produced of wheat, rye, oats, potatoes, hay, and fruit, for all of which the soil and climate appear well adapted. The tobacco is usually sold in the Henderson and Owensboro markets, and goes largely towards giving character to the excellent stemming staple so noted in these cities. On the highlands, orchards and vineyards flourish as well as in any part of the State, and rarely fail to pro-

duce good average yields. The four stars—Concord, Hartford Prolific, Ives Seedling, and Delaware—are the best grapes yet tried in this county, though other varieties do well. In live stock the farmers present a fair average in some of the best bloods of cattle, sheep, and hogs, though there is still a preponderance of the scrub stock, "which can make their own living in the range." In the fall and winter many hogs and mules are exported, generally for the markets of the Southern States. The young cattle and sheep are usually sold to persons who drive them to other counties to graze or fatten before they are sent to the butchers.

Churches and Schools.—There are well conducted academies at Calhoun, Sacramento, and Livermore, and several excellent private schools in the county, beside the free public schools of the State, which are taught in every district in the county; so that the children can all have an opportunity of receiving a good English education. The principal religious denominations are the Primitive Baptist, the Catholic, the Methodist, Presbyterian, Reformer, Missionary Baptist, and Universalist. The church buildings are generally good, and well adapted to the need of the members, and the congregations large and intelligent.

Domestic Arts.—The good, industrious ladies of McLean, in many neighborhoods, still hold on to the old custom of manufacturing all the every-day wear upon the hand-loom; and as there are many families of German descent, they use the flax-wheel, and make linen equal to that of the fatherland. They also traffic largely to the merchants jeans, linseys, linens, cottonades, counterpanes, knit socks, poultry, eggs, butter, cheese, flaxseed, beeswax, feathers, maple sugar, tree syrup, and ginseng, and add, by their industry and thrift, greatly to the aggregate wealth of the family. No people in the State are more refined, intelligent, social, industrious, and hospitable than the citizens of McLean county, and nowhere will immigrants find better society or more productive lands.

MEADE COUNTY.

From parts of Breckinridge and Hardin this county was taken in 1823, and named in honor of Captain James Meade. It is bounded northwest and north by the Ohio river, which separates it from Perry, Crawford, and Harrison counties, Indiana, on the east by Hardin, on the south by Hardin and Breckinridge, and on the west by Breckinridge county.

Streams.—The Ohio river bounds this county for more than sixty miles, and affords steamboat navigation to every neighborhood. The creeks running into the Ohio through this county are generally short, but have enough water to make fair mill streams. They are Otter, Doe, Wolf, and Spring creeks.

Geology and Soil.—The base rocks of this county are almost entire members of the sub-carboniferous or cavernous limestone group. This formation of limestone is not near so thick here as it is at the western limit of the adjacent coal field, nor are the "barren lands," which cover about three fourths of the county, either so deep in their clays and soils, or so rich in plant food, as are similar lands in the counties bordering upon the Tennessee State line. This is evidently owing to the thinness of the strata of the cavernous rocks from which these soils were formed. Meade has no minerals of consequence, except possibly some isolated deposits of limonite iron ores, which are not in quantities sufficient for profitable working. The surface of two thirds of the county is level, or gently rolling, and abounds in sinks and caves; the balance is more hilly, but not rough. The subsoil is a red clay (sometimes yellowish) underlying good dirt loam, rich in plant food. The soil contains potash, lime, phosphoric acid, and ammonia, in quantities sufficient to make it capable of producing excellent tobacco; but it easily tires, unless chemical fertilizers are added to restore what is taken off by the hoed crops each year. In order to do this, and to keep up, and even to increase the productive qualities of the virgin soil, the farmers should use every year, on their wheat, corn, and tobacco lands, a compost of one hundred pounds of gypsum, two hundred pounds of bone-dust, and about one hundred pounds of salt. If this is well mixed and sown broadcast on the level lands, and harrowed or lightly plowed in, just

before seeding or planting the crops, it would astonish by its results the average farmer. Green crops of peas and clover can also be plowed under to great advantage.

Agriculture.—The soil is peculiarly adapted for the growth of corn, wheat, oats, rye, clover, and tobacco; consequently we find the ruling crops are corn, tobacco, and hogs. Blue-grass will not grow to do any good upon this formation; but the hay grasses, such as herds-grass, timothy, orchard-grass, Hungarian, and millet, when properly attended to and well cultivated, yield good average crops. Fruits of all kinds, including grapes, do well on the ridges and highlands, while melons, vines, vegetables, and wild fruits and berries, flourish exceedingly in every part of the county. Hogs, sheep, and mules can be raised with profit; but the country is not so well adapted to blooded cattle and horses as are some of the more favored blue-grass counties; still, very good stock of cattle and horses could be raised, if better breeds were introduced and more attention paid to the clover and hay crops.

TOWNS AND VILLAGES.

Brandenburg, the county seat, has a romantic situation on the Ohio river, about 40 miles below Louisville. It contains a population of some 600 persons, has a good court-house and other public offices, several neat churches, an academy, a tannery, grist and saw-mills, a dozen mechanic shops, and several handsome private residences.

Big Spring, named from a large stream that bursts from the ground, and sinks after running a few hundred yards, is quite a nice, thriving village of about 100 inhabitants. This spring is the corner of three counties, viz: Meade, Breckinridge, and Hardin.

Concordia, *Flint Island P. O.*, *Wolf Creek*, *Richardson's Landing*, and *Rock Haven*, all on the Ohio river, and *Little York*, *Garrettsville*, *Grahampton*, *Garrett*, *Paynesville*, *Stapleton*, *Meadeville*, *Boonesport*, and *Hill Grove* are all neat, pleasant villages, each doing a good local business.

Domestic Arts.—The vices of fashion have not made much progress among the industrious, contented, and happy citizens of Meade; accordingly, we here find the spinning wheel, the cotton-cards, the distaff, the flax-wheel, and the hand-loom popular pieces of furniture in nearly every neighborhood, and the industrious ladies are well skilled in their practical use, making large amounts of cloth for home consumption and traffic. They also trade to the local merchants considerable quantities of feathers, eggs, poultry, dried fruit, honey, beeswax, home-knit socks, home-made sugar, and tree molasses. With these articles they frequently

more than pay the ordinary expenses of the family, and leave the corn, wheat, hog, and tobacco crops as clean profits.

Churches and Schools.—The Hard-shell Baptist, the Free-will Baptist, the Methodist, Presbyterian, Reformer, and Catholic are the principal Christian societies in the county. The church buildings are not elegant, but are generally well-built, neat houses, well adapted for the purposes intended in their construction. The congregations are usually large, and the members of every denomination are generally pious, working Christians, thoroughly satisfied with the wholesome faith that is within them. At Brandenburg, Concordia, Grahampton, and Big Spring are good academies or private schools; besides these, several others are located in the county. There are also public free schools taught under the State system in nearly every district; so that opportunities for getting a good education are within reach of all the children, if the parents will do their duty in sending them to the different institutions.

The People.—Meade county has a population remarkable for its general intelligence, high-toned honor, and observance of law and good morality, and universal spirit of hospitality. While there is no great wealth, there is no great poverty; and so free are the courts from litigation, that the few lawyers in the county are, most of them, thinking seriously of emigrating to better pastures; otherwise they will have to add some other industry to their calling in order to gain a respectable livelihood. The jail has nearly gone to decay for want of tenants, and most of the people are ignorant of the fact that the county has a poor-house at all. This is a happy land in which to live, and emigrants who want a good home can easily find it here.

MENIFEE COUNTY.

This county, named in honor of Richard H. Menifee, was taken, in 1869, from parts of Bath, Montgomery, Powell, Wolfe, and Morgan. It is bounded on the north by Bath and Rowan, on the east by Morgan, on the south by Wolfe and Powell, and on the west by Powell and Montgomery counties.

Geology and Soil.—This is one of the most variegated counties in the State in its geological formations. The upper Silurian, the Devonian shale, the Waverly knobs and sandstones, the sub-carboniferous limestones, the Chester Groups, and the true coal measures of the Eastern Kentucky coal field, being here mixed, in almost endless confusion, just as the depressions, upheavals, or water-washings have brought the one or the other series of rocks to the horizontal surface of the country. There is no telling how the lands of this county do lie, until the mapping of the country, now partly constructed by the Geological Survey, is completed. Suffice it to say, that the general surface of the country is hilly and mountainous; that the soil of the bottoms is rich and fertile; that in some places the ground is wet and slashy, and on the ridges and bluffs sandy and poor, and often quite rocky. There is a great abundance of coal and iron ores and mineral and salt waters, and as fine forests of timber as can be found in the State, containing every kind of trees usually found in the north temperate zone, growing upon the hilly, mountainous regions. It is also well covered with wild fruits, nuts, plums, cherries, succulent pea-vines, cane, and wild grasses, suitable for stock of all kinds, but particularly adapted to sheep-raising. The iron ores, coals, and forests are mostly as nature produced them, having never been much disturbed by the hands of man. There will be but little change until railroads are built.

Water-Courses.—Licking river runs along the northern boundary of Menifee. Its tributaries are Beaver, Slate, and Blackwater creeks. Red river forms a part of its southern boundary. Its tributaries are Glady, Copperas, Spahr, and Indian creeks. All these streams have good fall, and afford a large number of excellent sites for mills, furnaces, or factories. Red river and Licking are each sufficiently large to be improved by slack-water locks and dams, so as to become navigable for steam-boats, flat-boats, keels, and rafts.

Agriculture.—Farming in this county has not been carried on so extensively as in many other parts of the State, partly owing to the hilly and mountainous nature of the country, and partly to the difficulty of taking produce to market. The better lands produce excellent corn, wheat, oats, rye, barley, buckwheat, flax, and tobacco; while the southern and eastern sides of the hills and ridges are unsurpassed for vineyards and orchards. The native improved grapes might here be made to prosper as well as they do in most grape countries in Europe, and wine and brandy-making could be made to pay better than any

other branch of agricultural pursuits. Live stock of all kinds do well, although few except the scrub breeds are to be found in the county. Everything points out Menifee as being peculiarly suited for sheep and wool-raising, and no doubt, within a few years, here will be found some of the finest flocks of Cottswolds, Merinos, and Southdowns produced in America.

TOWNS AND VILLAGES.

The citizens of Menifee are a hardy, free-born race, and cannot brook the restraints thrown around the inhabitants of pent-up cities. They enjoy the mountain air, the grand picturesque scenery, and freedom from restraint; therefore, they never assemble in large communities, or build large towns, but are content to have *Frenchburg* for their county seat, with its comfortable court-house and about seventy-five citizens; and *Rebelville*, with its store and blacksmith shop; and *Millville*, with its store and hotel, leaving the trouble and expense of making larger towns or cities to those who may come after them, should there ever arise a necessity for their use. For the present, these honest, philosophical citizens are satisfied to enjoy life amidst the native majestic forests in their comfortable homes, where pride, fashion, and vice rarely enter. Possibly some day they may become richer and more troubled thereby, but certainly never happier, or more honest and hospitable.

Schools and Churches.—The common free school system of the State has been inaugurated in this county, and schools are now taught in nearly every district. The people take a commendable pride in educating their children, and the attendance at the schools has greatly improved within the last few years. The Hard-shell Baptist, the Free-will Baptist, the Reformer, the Methodist, and Presbyterian are the principal religious denominations. The church buildings are plain and unpretending in their style of architecture; but then they suit well the intelligent, honest seekers after truth, who delight in good works and a practical faith more than gilded chapels, made to please the eye of fashion, or gain the applause of the proud.

Domestic Arts.—The industrious, healthy, intelligent females of Menifee make all the cloth of every-day wear upon the hand-loom from thread spun upon the flax or cotton wheels; and they feel it is no disgrace to prove themselves in truth helpmates to their husbands, who attend to the farms, and do the hunting and fishing needful for the family. The women also traffic largely to the country merchants for "store cloth," "spun truck," and groceries, large amounts of dried fruits, eggs,

poultry, butter, home-knit socks, beeswax, honey, ginseng, maple sugar, tree molasses, and other things, which they manufacture with their own hands in the primitive way learned from their mothers and grand-parents. There are no large factories of any kind, but many saw and grist-mills, and numerous mechanic shops.

Habits of the People.—These people have never injured their mental vigor by the excitement and hurry of becoming rich too suddenly, but, like true philosophers, take matters easy, and abide their time upon all occasions. They delight in country frolics, dances, quiltings, log-rollings, house-raising, and shooting matches. They love to fish and hunt, even if these sports sometimes interfere with "speeding the plow." They have wisely learned that this life is wasted if spent alone in money-making; therefore, they keep quiet on that point, but live bountifully upon whatever good things they can produce at home, or find in the woods, or catch from the streams; and they enjoy the presence of their family circle without a thought for future troubles, which are never courted beforehand. It is true happiness thus to live, and it would be folly to change these habits until the railroads force more nervous temperaments upon the physical organisms of the people. Parties from the adjacent counties often go to Menifee to hunt and fish, where they stay for weeks, with marked success. The people desire emigrants to come and develop the mineral, timber, and agricultural wealth, and will heartily welcome all such additions to their population.

MERCER COUNTY.

This county, named in honor of Gen. Hugh Mercer, was formed by the Virginia Legislature in 1785 from a part of Lincoln county, and is now bounded on the north by Anderson and Woodford, east by the Kentucky river, which separates it from Woodford, Jessamine, and Garrard, south by Boyle, and west by Washington county.

Geology and Soil.—This county is based entirely upon the upper Cambrian or lower Silurian and the upper Silurian rocks. The general surface of the country is undulating. There is no coal or other minerals in

this county, except a small quantity of lead ores, associated with sulphate of barytes, which have been found in veins traversing the Kentucky river marble rock, near the mouth of Shawnee Run, and probably at other places, but in quantity too small to warrant regular mining operations. At the mouth of Dick's river, on the Kentucky, are some of the best exposures of the lowest limestones of the Silurian group to be found in the State, and the romantic cliffs of marble rock here hem in both rivers in the deep gorge through which the waters have cut their way. These fine cliffs, the bed of the river, and the deposit of the metallic lodes of lead ore and barytes, are no doubt connected with the great axis of disturbance which took place in this part of the continent at a very early geological epoch, possibly before the deposition of the sub-carboniferous limestones. The county is divided into two distinct agricultural regions, by a line running nearly centrally through it from north to south. To the west of this line the soil is, for the most part, shallow near the rock, especially where the small straight ash grows; yet these lands are quite productive. To the east of this line the soil is deeper, and was formed by the disintegration of some of the best strata of the Silurian blue limestones. This is emphatically the blue-grass section of Mercer, and for the production of corn, hemp, and blue-grass cannot be excelled in Kentucky. The southeastern part of the county is somewhat broken, and has a growth of white and black oak. This is less adapted for hemp, but is well suited for the smaller cereals and tobacco. In the neighborhood of Cornishville, the subsoils are in many places richer than the top dirt. Deep plowing and subsoiling would here prove very advantageous, especially after the under clay has been exposed to the action of the atmosphere and winter freezes. Throughout this county, at various depths, are found beds of marls or marly rocks, some of which will in the future, no doubt, prove to be good fertilizers for the worn soils of this and the adjacent counties. The "birds-eye limestone" or Kentucky marble, together with other fine building stone, can be found in unlimited quantity throughout the county, though in many places at some depth below the clay. In the western portion of the county, in the upper Silurian, and bordering on the Devonian, are strata of magnesian rocks, which will probably do well for hydraulic cement. The western half of this county can be greatly benefited if the farmers would use chemical fertilizers on their worn lands. These fertilizers are needed in nearly all soils that have been long in cultivation; but the continual disintegration from the thin beds of the blue

limestone and marlites of the upper Cambrian or lower Silurian, to a considerable extent counteracts the loss from crop culture on this class of soils.

Streams and Railways.—The Kentucky river flows along the eastern border of this county, and affords navigation throughout the year. Dick's river forms the boundary between Mercer and Garrard; Salt river passes from south to north centrally through the county; Chaplin's Fork, Jennings, Rocky, Lyon, McCown, Thompson, and Shawnee creeks, all give excellent drainage, and supply water-power for mills and factories. The Cincinnati Central Railroad enters the county near the mouth of Dick's river, crossing the Kentucky at the noted cliffs heretofore spoken of, and passes through the southeastern part of the county on its way southward to Chattanooga, Tennessee. This gives free and easy communication every day to all points north and south for both passengers and freight.

TOWNS AND VILLAGES.

Harrodsburg, the oldest town in the State, is beautifully located upon a commanding plateau, about one mile east of Salt river. It has a good Court-house and other public offices, fine churches, a female college, grist and saw-mills, tannery, planing-mill, wool-carding mills, agricultural works, a score of mechanic shops, and many elegant private residences. The population of about twenty-five hundred persons are noted for their intelligence, refinement, hospitality, and marked social and moral excellences.

Union Village or Pleasant Hill is a Quaker or Shaker settlement of four hundred inhabitants, beautifully located on the Lexington and Harrodsburg Turnpike, one mile west of the Kentucky river. These Shakers are a peculiar religious sect, who live in one common family, refusing to marry, and working and owning all things in common. The sexes are kept separate, and the strictest code of virtue and morality is practiced. They all believe in spirit communication through the opening of the spiritual natures inherent to humanity. They view Christ as a brother in the flesh, and also in spirit, but not as a part of Deity, otherwise than as all other souls are a part of the soul of God. This community of Shakers is very rich, having beautiful luxuriant fields and gardens, orderly and flourishing schools for adopted children, and everything in profusion that can produce comfort and prosperity. Their pedigrees of live stock are among the best in the United States.

Sakisa is a handsome town of 200 inhabitants, 11 miles north of the county seat.

Cornishville, located in the west part of the county, on Chaplin Fork, is quite a business place of 200 inhabitants.

Oregon is at the head of slack-water navigation on the Kentucky river.

Lucto, *Chaplin*, *Bohon*, *Nevada*, *Dugansville*, *McAfee*, *Duncansville*, *Oak Hill*, and *Rose Hill* are all neat, thriving villages, each doing the necessary trade of its surrounding neighborhood.

Schools and Churches.—The Daughters' College, located at Harrodsburg, is an excellent institution, under the management of John A. Williams, President, assisted by an able faculty. It has beautiful grounds and buildings, and is largely patronized by the citizens of Mercer and the neighboring counties. Prof. A. S. Loventhal conducts a first-class high school for boys at Harrodsburg. There are in the county several other good private schools, beside the free public schools taught under the common school system of the State in every district. No county is better provided with educational facilities than Mercer, or is more thoroughly interested in having all the children well taught. The Catholic, the Reformer, Methodist, Baptist, Presbyterian, Episcopalian, and Shakers are the principal Christian denominations. The church buildings are generally fine specimens of architectural skill, and are freely scattered in every neighborhood in the county. The church members are devoted to their sects, and the ministers are usually well educated, eloquent speakers and teachers, noted for their morality and piety. Their salaries, though not very large, are usually promptly paid, and afford a good living.

Social Characteristics.—The citizens of Mercer are generally descended from the original Virginia settlers, who came early to Kentucky, and were pioneer Indian fighters. The bravery and chivalrous hospitality which grew up with these early settlers are still characteristics of their descendants. The intermixing of some excellent families from England, Scotland, Ireland, and Germany have added to these characteristics, until now nowhere can be found a more brave, proud, polished, intelligent, and hospitable community than the people of this section of Kentucky. The rich lands, fine breeds of live stock, and superior blue-grass of this section, have long since made the people of Mercer too rich to make home-spun cloths; still, they are not a boastful, aristocratic race, but magnificent specimens of nature's noblemen and fair women, who live on the fat of the land, and consider themselves equal to the best of

the human race, and everybody else as good as themselves who will prove themselves worthy by their industry, intelligence, and moral worth. During the late civil war, this county had the honor of supplying the Commonwealth with her Chief Executive, in the person of Hon. Beriah Magoffin, who takes great delight in advancing the interests of old Mercer.

METCALFE COUNTY.

In 1860, Metcalfe county was taken from parts of Barren, Green, Adair, Cumberland, and Monroe, and named in honor of ex-Gov. Thomas Metcalfe. It is bounded on the north by Hart, Green, and Adair, east by Adair and Cumberland, south by Cumberland and Monroe, and west by Barren county.

Topography, Soil, and Geology.—This county is situated in the central southern portion of the State, upon the waters of South, Middle, and East Forks of Little Barren river, and contains a great variety of soil, owing to the peculiar geological formations upon which it is based. The west half of the county is located on the cavernous limestone; lies level or gently rolling, and has a good red clay subsoil, with a rich mould surface, well adapted to all the cereals and tobacco. The eastern and southeastern parts are on the Waverly series, declining to the Devonian shale, and consequently are thinner in soil, and pass into the "knobby hills" and the flats adjacent. These latter lands grow a fine quality of tobacco, and, with proper tile-drainage of the sobby lands, and the use of chemical fertilizers, would produce most excellent wheat, corn, and hay. They are also well adapted on the hills and ridges for orchards and vineyards. There is no coal, and probably not iron ore enough for profitable working in the county; but as it lies along the axis of the "oil dip" of rocks, there may hereafter be discovered good wells of coal oil. There are several mineral springs of excellent water in the county. When exhausted by careless cultivation, the lands of this section can be greatly improved by the application of land plaster, German kainit, ashes, and superphosphates, or the South Carolina marls.

TOWNS AND VILLAGES.

Edmonton, the county seat, is situated about the centre of the county. It contains about one hundred inhabitants; has a good court-house, an academy, mill, several mechanic shops, and two good hotels. *East Fork, Glovers, Knob Lick, Pace, Randolph, Rockland Mills, Poplar Springs, Crossplains, Centre, and Willow Shade* are all neat, thriving villages, each doing a good local trade.

Schools.—There are two excellent academies in Metcalfe county, and public State schools in every district. The people manifest great interest in having their children educated, and the school attendance is therefore generally good. Here every child can easily obtain a fine common school education with but little cost.

Churches.—The Iron Clad Baptist, the Methodist, Reformer, Presbyterian, Missionary Baptist, and Universalist are the principal religious denominations. The church buildings are not very expensive, but of that primitive style of architecture that affords room and comfort. Such a thing as rented cushioned pews is unknown and tall cupolas are not fashionable; but among the church members will be found solid men and women, whose intelligence teaches them that it is better to have a good faith, and do good works, than to sit in fine churches, or listen to the flashy sermons of high-paid preachers from crimson pulpits.

Domestic Arts.—The noble, industrious ladies of Metcalfe still ply the distaff, handle the cotton-cards, sing to the music of the spinning-wheel, and make profitable the old-fashioned hand-looms. They manufacture at home most of the jeans, linseys, cottonades, linens, blankets, counterpanes, &c., used by the family, and a surplus for traffic to the local merchants. They also trade largely to these merchants eggs, butter, poultry, feathers, home-knit socks, dried fruit, and berries, apple-butter, melons, maple sugar, tree molasses, and ginseng. The male portion of the population seldom have anything to do with these smaller industries, but employ their time in cultivating the field crops, handling the live stock, and attending to the farms.

Crops and Fruit.—Corn, wheat, oats, rye, and tobacco are the staples of Metcalfe, and while blue-grass does not grow here so well as in the lands based upon the blue limestone, yet the farmers have good pastures and hay fields from clover, herds-grass, timothy, orchard-grass, Hungarian, and millet. The *king* crop is tobacco, which is cultivated on nearly every farm, and sold in the Louisville market. Peaches, apples, quinces, pears, cherries, plums, and all sorts of berries, nuts, and small

fruits flourish kindly, and orchards seldom fail to produce a good yield. Grapes grow as well on the hills of this county as anywhere in the State, and so far as vineyards have been tried, they have proved a decided success. These lands, well attended to and properly drained, will produce over 10,000 pounds of excellent Concord, Ives Seedling, or Hartford grapes to the acre, which will make a fine quality of wine of from five to six hundred gallons.

Live Stock.—The scrub stock of cattle, hogs, and sheep still hold control in this county. The people seem to fancy the breeds of black and pied cows, which the first settlers brought from Virginia and North Carolina, and the long snouted razor-backed swine, that can scent a sweet-brier root or angelica two feet under the ground, and will poise themselves on their fore-feet on a perfect balance, while rooting for these delicious articles of food. But a few public-spirited, wide-awake farmers are beginning to introduce better breeds of all kinds of live stock, so that within a few years, no doubt, Metcalfe will be able to show pedigrees of as good breeds as the blue-grass section of the State. Mules are raised in large numbers each year for the Southern market; these bring a considerable revenue into the county.

The People.—No county in the State can boast of a more kind, liberal, hospitable, industrious population than Metcalfe. They are an intelligent community, without any formality of fashion, aristocracy, or selfish pride. They all live well, do their own work, have their log-rollings, house-raising, quiltings, and dancing frolics, to which all are invited, and where every one does his or her part in order to become useful and to add to the common labor or amusement of the company. In such a community, it is a joy to live, such as is never felt by the purse-proud aristocrat or the poverty-stricken specimens of humanity who inhabit the gilded houses or squalid alleys of our metropolitan cities. Let emigrants from other States and countries who want cheap, rich lands, and good, happy homes, and hospitable neighbors, go to Metcalfe, and they will not be dissatisfied.

MONROE COUNTY.

In the year 1820 this county was taken from parts of Barren and Cumberland, and named for the then President of the United States, James Monroe. It is located near the middle line of the State, on the Tennessee border, and is bounded on the north by Barren, Metcalfe, and Cumberland, on the east by Cumberland, on the south by the Tennessee State line, and on the west by Allen and Barren counties.

TOWNS AND VILLAGES.

Tompkinsville, the county seat, is handsomely located on Mill creek, about the centre of the county. It contains about 300 inhabitants, two fine churches, a good court-house and public offices, grist and saw-mill, carding factory, half a dozen mechanic shops, and several neat, well appointed private dwellings.

Martinsburg, Johnstonville, Centrepont, Gamaliel, Hilton, Fountain Run, Meshack's Run, Mud Lick, Rock Bridge, Sulphur Lick, Rocky Point, and Flippin are all pleasant villages, each doing considerable local trade.

Geology and Soil.—The Waverly series of sand rocks prevail generally throughout this county, although the creeks and rivers, particularly the Cumberland, have cut their channels through to the lower Silurian or upper Cambrian limestones. Dr. Owen, in his Geological Survey, estimates the ridge between Big Barren river and Sulphur Lick creek to be about 600 feet high. This ridge contains immense masses of grey and green shales, overlying the black slate, which latter is here only about 25 feet thick (the same is 55 feet thick in Marion county), while the overlying shales are probably 250 to 300 feet thick. These shales are overlaid by the mudstone formation and some of the lower strata of the sub-carboniferous limestones. Above these are the cavernous or Lithostrotion limestone, which distinguish the "barren lands." Under the black shale are found some imperfect veins of sulphurets of zinc, particularly in the bed of Sulphur creek. Some iron ores are also found above the black shale. There are no coal beds in this county, and not enough minerals, so far as has been discovered, to make mining profitable. The surface of the country, in its diversified character, corresponds to the underlying rocks—in some parts level, with caves and "sink-holes" or "basins," in other parts undulating, and then running into a rough,

hilly country. The bottoms and level lands are very fertile, the rolling lands good second-rate, and much of the hill and ridge lands thin and sometimes rocky. These lands, however, can be greatly improved by proper use of chemical fertilizers.

Agriculture.—Tobacco grows well, which, with corn, wheat, oats, rye, hay grasses, and flax, form the chief staple crops. The produce of the farm in corn and the cereals is generally fed at home to mules and hogs, which are exported in considerable numbers every fall and winter to the southern cotton States. The original cattle, sheep, and hogs, known as scrub stock, still hold sway in this county, although better breeds are gradually filling in from the adjacent counties, and occasionally from the blue-grass country. Sheep flourish here as well as in any part of the State, and no doubt a cross of Cottswold and Merino on the common stock would produce a class of wool-bearing animals which would be more than double as profitable to the farmers as those now bred. Fruit of all kinds grows well, and orchard trees last for a long period of years. Grapes, both wild and cultivated, flourish, and vineyards of the four star native vines (Concord, Hartford Prolific, Ives Seedling, and Delaware) would probably be more profitable on the hill and ridge lands, if properly cared for, than any other class of cropping whatever.

Transportation.—The Cumberland river is the only navigable stream in the county for steamboats, which ply as far up stream as Burksville, in Cumberland county, during the winter and spring months. There are several fine mill streams having good water-falls, and sufficient supply of water for driving large amounts of machinery. The nearest railroads are in the adjoining county of Barren.

Schools.—There are two good academies at Tompkinsville, and several private schools in the county, beside the State free public schools, which are taught in every district. The citizens are paying more attention than formerly to the education of their children, and evincing a commendable zeal in having them accept of all the benefits accruing from the State public school system.

Churches.—The Primitive Baptist, Methodist, Presbyterian, Free will Baptist,³ Reformer, Universalist, and some Catholics, form the religious Christian membership in this county. The church buildings are generally plain in structure, but commodious and well suited for the wants of the people, who believe more in good works and true faith than in ostentatious church buildings, or loud-sounding fashionable sermons, uttered by high-salaried priests or preachers, who mete out their spiritual food according to the number of the shekels of silver.

Domestic Arts.—The ladies of Monroe county are noted for their intelligence, thriftiness, and industry, and also for the fine specimens of jeans, linseys, cottonades, linens, and counterpanes which they manufacture at home, upon the old-fashioned hand-loom. They also traffic largely with the country merchants in their products of poultry, eggs, butter, beeswax, home-knit socks, feathers, dried fruit, chestnuts, maple sugar, tree molasses, and ginseng root. These they trade for “store goods” and groceries, and thereby save a considerable sum each year to the common revenues of the family. The men also occasionally add something by means of peltries and furs, which are traded to the merchants; but, as a general rule, the lords of creation here, as elsewhere, spend the most of their time in attending to farm work and live stock, and occasionally in popular conventions, where they regulate by resolutions the political economy of the country.

The People.—Monroe county has never been invaded by the vices of the metropolitan centres of the nation; but the people, not being tempted by great riches or speculation, quietly enjoy a life of rectitude and honest labor upon their farms, and rarely ever venture beyond their present means by getting advances on imaginary crops or vain speculations, but follow the good old maxim of “pay as you go.” They consequently keep out of debt, and are ignorant of what the city people mean by “hard times.” Still they are intelligent, thrifty, industrious, and remarkably hospitable; knowing the great value of the natural resources, are anxious to have emigrants come and settle and help develop the country.

MONTGOMERY COUNTY.

This county was cut off from a part of Clark in 1796, and named in honor of Gen. Richard Montgomery. Originally the county contained a very large area of territory, but it has been trimmed and mutilated in the formation of eighteen other counties, until now it is one of the smallest and most curiously shaped counties in the State, being nearly patterned after the form of the famous giant's coffin. It is at present

bounded on the north by Bourbon and Bath, on the east by Bath and Menifee, on the south by Powell and Clark, and on the west by Clark and Bourbon counties.

Geology, Streams, and Soil.—The base rocks of this county belong mostly to the lower and upper Silurian group, which afford by their disintegration some of the most fertile soils in the State. Hinkston creek and Red river, with their tributaries, drain the entire county, and supply water-power for saw and grist-mills; the principal of these tributaries are Flat, Lulbegrad, Slate, Spencer, Somerset, and Sycamore creeks. There are no workable minerals or coal in the county, except in the eastern part next to Menifee and Powell counties. Here the Devonian shale outcrops and passes rapidly under the Waverly sandstones, and these under very thin strata of sub-carboniferous limestones, which are capped by the conglomerate and the lower rocks of the true coal measures of Eastern Kentucky. These variegated formations cause Montgomery to have the richest kind of lands in the central and western parts of the county, but a different quality of soils in the eastern or southeastern parts. Where the black shale outcrops, some iron ores similar to those of Bullitt and Nelson counties are found; also streaks of glady lands, known as "sobby beech." These, however, are of small extent, and subject to great improvement by tile drainage. The sandstone lands are less fertile, but are free and easily worked. Blue-grass grows most luxuriantly on all of the soils based upon the blue limestone, and hemp flourishes here equally as well as in Fayette. These soils are very deep and rich, which causes the crops to stand drought as well as in any part of the State.

Agriculture.—Hemp, flax, corn, wheat, oats, rye, and tobacco are the principal products, all of which grow well, and rarely ever fail of a good average crop. For live stock Montgomery is as well adapted as Fayette or Woodford; and annually supplies the Northern and Southern markets with many of the best horses, mules, Short-horn and Alderney cattle, as well as Cottswold, Merino, and Southdown sheep, and breeding and fatted hogs, which go from the Western States. The farmers and stock-dealers believe in good pedigrees, and will scarcely look at any animal that cannot trace back to the proper ancestry. Several gentlemen of wealth and judgment import every year the choice kinds of cattle, hogs, sheep, poultry, &c., from all parts of the world, so as to keep up the most active system of progressive improvements that may be needed to give the choice varieties and best points for both looks and

utility. In orchards, vineyards, flower and vegetable gardens, Montgomery is the peer of any of her sister counties. All kinds of large and small fruits do well, and rarely fail of a full crop; while garden products are always to be found in ample supply for all practical purposes. Bees do excellently, and honey in unlimited quantities could be produced at a mere nominal cost. The hilly portions of the county are suited to wool-growing, and nowhere will long or fine-wooled sheep flourish better than in the eastern parts of Montgomery.

TOWNS AND VILLAGES.

Mount Sterling, the county seat, is handsomely situated on Hinkston creek, near its source. It has a good court-house and other public offices, six or eight elegant churches, an excellent academy, a steam saw and grist-mill, planing-mill, many beautiful private residences, a dozen mechanic shops, and a population of nearly one thousand five hundred. The Elizabethtown, Lexington, and Big Sandy Railroad has been completed from Lexington to this point, and runs daily in connection with the Louisville and Lexington Railroad. *Jeffersonville*, *Aaron's Run*, *Elm Hill*, *Howard's Mill*, *Montaview*, *Levee*, and *Siderview* are small neat villages, each doing the necessary local trade of its neighborhood.

Schools and Churches.—The Mount Sterling Female College, under the able management of Prof. W. H. Savage and several tutors, is located at the county seat. This is a first-class institution for the instruction of young ladies. Mrs. Roger Hanson has a female school, with about thirty students, at the same place. There are several private mixed schools of merit in the county, besides the free public schools taught in each district under the common school system of the State. The people take a commendable interest in the subject of education, and strive to have their children well provided with all possible facilities for general instruction. The Old-line Baptist, Reformer, Methodist, Free-will Baptist, Presbyterian, Catholic, and Episcopalian are the principal religious Christian denominations. The church buildings are mostly finely built, and are large, commodious structures, well adapted to the uses of the intelligent members who worship in them. These buildings are thickly scattered throughout the county, so that one or more can be found in every neighborhood. The ministry is well supplied with pious, devoted, well-educated preachers, who deliver elegant sermons, and who receive generally good, promptly paid salaries.

Lesser Industries.—The people of Montgomery have become so rich, through the sales of fine stock and other farm products, that they now

seldom manufacture at home the cloth for family use, as was the custom twenty-five to fifty years ago. They find it preferable to exert their energies in other channels, which are more lucrative, and to purchase goods made by machinery in other countries. The well-educated ladies, however, are not idlers because they do not spin and weave, but they keep themselves busy in housekeeping and attending to all the various little affairs which continually arise in the management of the household and nursery. They also superintend the gardens, poultry, and bee-raising, and the sewing and knitting necessary to keep the family comfortable and well dressed; and in this way do their full share in making home happy, and in adorning society. Comparatively little capital is employed in manufactures in Montgomery; still, we find here an ample supply of mills, tanneries, wagon and plow shops, mechanic shops, and various classes of mechanical works to supply the needs of the people.

Popular Characteristics.—The high-minded, well-educated citizens of this county are noted for their industry, thrift, good morals, bravery, obedience to law, and genial hospitality. Their rich lands have made them educated, refined, and independent; consequently, they have but little need of a poor-house, jail, or court-house. Litigation is confined mostly to such cases as are necessary in settling estates, or in defining titles to lands, and even these are becoming every year of less importance. The society is first-class in every respect, being perfectly free from religious or sectarian prescriptions or aristocratic follies. Every man is considered a gentleman and every woman a lady, until they degrade themselves by their own acts. Industry, energy, high-toned honor, and intellectual attainments are here the true and only passport to honors and preferment. The dwellings of the people are generally handsome, well built, and nicely adorned with lawns, gardens, and flowers, and present to the eye pictures of contentment, thrift, and happiness. The large planters would be pleased to subdivide their farms and have the good citizens of other countries come and settle on them, and aid in the development of the great natural wealth of the country.

What is Needed.—This county, like all others in the blue-grass section of the State, need men of enterprise among the farmers, who will co-operate as they do in New York, Ohio, and England in forming large dairy associations for the manufacture of butter and cheese for home use and export. (See under head of Dairying.) It also needs to have something returned to the soil in place of the crops taken off each year. (See Fertilization.) It also needs more factories of every class, so as to keep at home more of the money that is every year sent abroad.

It also needs more small land-owners and smaller farms, and a greater subdivision of labor. When these needs are all supplied, then indeed will old Montgomery be a garden spot on earth. The same may be said of every blue-grass county in Kentucky.

MORGAN COUNTY.

Morgan county was taken from Floyd and Bath in 1822, and named in honor of General Daniel Morgan. It is bounded on the north by Rowan and Elliott, east by Elliott, Lawrence, and Magoffin, south by Magoffin, Breathitt, and Wolfe, and west by Wolfe and Menifee counties.

Geological Formations, Minerals, and Soil.—The true coal measures of the Eastern Kentucky coal field underlie this entire county, and make it exceedingly rich in coal, iron ores, copperas, and mineral springs. There are several strata of cannel, semi-cannel, and bituminous coals, varying in thickness from 30 to 50 inches. The iron ores (limonites) are found in beds in different parts of the county, in quantity sufficient for profitable mining. These ores are very similar to those of Bath and Lawrence counties, and are probably inexhaustible. The soil, being based on sandstone, is not so rich in plant food as are lands of the limestone sections, yet this soil, if properly managed, yields good crops of tobacco, corn, wheat, oats, rye, and hay.

Water-courses.—Licking river runs diagonally through this county from southeast to northwest, affording fine water-power and many excellent sites for mills, furnaces, or factories. It might be made navigable for boats by a skillful system of locks and dams. Its tributaries, Caney, White Oak, Elk Fork, Grassy, Blackwater, Rockhouse, &c., give good drainage, and are sufficiently large for good mill streams. These rivers and creeks abound in the finest of mountain trout and other game fish, and can be made to yield a large supply of food when the fish commission of the State get them well stocked from the hatcheries that will, no doubt, be established in due time. There being no navigable streams or railways over which the coal, minerals, and agricultural products of

Morgan can be taken to market, necessarily paralyzes these industries, and keeps back the development of its rich natural resources.

Agriculture.—This branch of industry overshadows all others in Morgan, yet it is but partially successful, owing to the difficulty of getting produce to market. Corn, wheat, rye, oats, tobacco, buckwheat, clover, and the hay grasses grow well on the bottoms and upon the best of the uplands. Fruits of all kinds do remarkably well, and orchards never fail of producing a good yield. Vineyards (so far as they have been tried) have been a success, and no doubt the cultivated native varieties of vines, if well cared for, can be made to yield here equally as well as the vineyards of Spain or Switzerland. The nutritious mountain grasses are suited to cattle and sheep-grazing, and many herds are every year driven from the limestone counties to Morgan to graze through the summer months, and then return as fat as it is possible for them to get. The shrubs, grasses, moss, and bitter plants of these mountain counties peculiarly fit them for the industry of wool-growing and sheep-raising, and no doubt will, within a few years, make all this section the favorite pasture grounds of the State for large flocks of the best breeds of Southdowns, Merinos, Cotswolds, and other well-bred varieties. Honey can be here produced at a mere nominal cost, owing to the great number of trees and plants producing flowers suitable for bees to feed upon. The wild bees even now deposit in the hollow trees of the forest a sufficiency of this delightful food for the use of the inhabitants, who hunt for "bee-trees" with as much zeal as they fish in the creeks or "drive for game in the woods."

TOWNS AND VILLAGES.

West Liberty, the county seat, is handsomely located on the north bank of Licking river, about the centre of the county. It has a population of about 200, the usual public buildings, three churches, a grist and saw mill, an academy, half a dozen mechanic shops, and several neat private residences.

Bangor, 10 miles northwest, and *Blackwater*, 14 miles southwest of West Liberty, are flourishing villages, each doing a considerable local traffic.

White Oak, *Cany Fork*, and *Walnut Grove* are small places, doing the trade of their neighborhoods.

Domestic Arts.—The primitive customs of the first settlers still hold sway in this section of the State, and here are found those good old (once popular) pieces of household furniture, the wheel, the warping-

bars, and the loom. The industrious women know well how to use them, and manufacture from the wool, cotton, and flax produced on the farms, all kinds of cloth necessary for the every day wear of the family, and a large surplus to be traded to the country merchants for "store goods," groceries, ammunition, and fancy articles. They also produce and traffic largely in beeswax, dried fruit, home-knit socks, eggs, poultry, ginseng, butter, maple sugar, and tree molasses. The men rarely have anything to do with these articles, which fall entirely under the charge of the females of the country; but they are fond of hunting foxes, wolves, deer, &c., and make quite a sum each year by selling peltries, wolf and fox scalps, and by supplying venison and other game to the people of the adjoining counties.

Schools and Churches.—Except the academy at New Liberty, the only schools are those taught under the free common school system of the State. Of these, one is taught in nearly every district, and the people are becoming more deeply interested in their success. The attendance by pupils, though not so good as may be desired, is much better than formerly, and will no doubt still improve as the system becomes more thoroughly understood by the citizens. The Hard-shell Baptist, the Methodist, Free-will Baptist, and Reformer are the principal denominations of Christians. These have their church buildings (which are usually well-hewn log houses) scattered through the county, so that one or more can be found in almost every neighborhood. The members are devoted, working Christians, not at all addicted to show or ceremonious pomp, but depend on good works and a zealous faith to forward them in the straight and narrow path of rectitude and safety.

Sports and Amusements.—The intelligent, hospitable citizens of Morgan are no great enthusiasts for money-making or brain-destroying speculations, but quietly pursue the even tenor of their way, and, as true philosophers, enjoy life as they pass through their earthly experiences. Accordingly, we find here a general love of the manly sports of hunting, fishing, dancing, &c., &c., which are by many even preferred to the hard work of the farm. The people all love to assist their neighbors, and, therefore, when a house is to be built, corn to be husked, harvests to be saved, a wedding to be consummated, logs to be rolled, or a quilt to be completed, they usually call together all their friends (who never fail to respond), and all spend a day (or several days if necessary) in lightening over the job, upon the principle that "many hands make easy work." At these meetings the labor to be performed is apportioned and first

completed; then all persons do their best to add to the pleasures and amusements of the occasion. The old people smoke, talk, and play "old sledge," or some other innocent game, while the young men and girls dance, frolic, enjoy country plays, and have a good time generally. All are upon an equality, and there are no unsocial cliques acting on the reserve, and withdrawing from the sports and amusements because they would have society divided into "longs and shorts," in order to please their foolish notions of selfish, aristocratic pride. Every man is here considered a gentleman, and every woman a lady; and nothing gives excellence or position except industry, moral worth, and superior mental acquirements.

Emigration is needed to fully develop the great riches which nature has implanted in Morgan county, and this will surely follow when railways are built to open up the country.

MUHLENBURG COUNTY.

In 1798 this county was taken from parts of Christian and Logan, and named in honor of Gen. Peter Muhlenberg. It is bounded on the north by McLean, northeast by Green river, which separates it from Ohio county, on the east by Butler, south by Logan and Todd, and west by Christian and Hopkins counties.

Geology, Minerals, and Soil.—The true coal measures of the Western Kentucky coal field prevail over all this county, except a narrow section next to Todd and Logan counties, which is based upon the upper strata of the sub-carboniferous limestones. The mill-grit and conglomerate sand rocks underlie the coal beds, there being no sub-conglomerate coal beds as yet found in this field. Iron ores of various kinds—kidney ore, black band ore, argillaceous ore, limonites, and pot ores—are found everywhere associated with the different coal beds. At Airdrie Furnace, near Paradise, on the banks of Green river, the stratum of black band ore is about twenty inches; at Buckner's Furnace it is not less than thirty inches, and a mile or two distant the fossiliferous iron ores are several feet thick. On Lick creek, limonite ores, similar to

those of Lyon and Trigg counties, appear in connection with the sub-carboniferous limestone rocks. In many other parts of the county excellent beds of kidney, pot, black band, and other iron ores are found in quantity. The bituminous coal beds in this county are to be found throughout the coal measures, varying in thickness from one to nine feet. On Mud river and some other places, both in this and Butler counties, are beds of excellent "block coal," similar to that found in Indiana, about forty-five miles west of Louisville, Kentucky. This block coal on Mud river lies about twenty feet above the water level, and is practically inexhaustible in quantity. The Louisville and Paducah Railroad, which runs centrally through the county from east to west, passes the entire distance through coal fields, in which are not less than from 6 to 12 distinct strata of parallel coal beds, aggregating probably a thickness of thirty feet of excellent coal. At McNary's bank, two miles east of Pond river, there are two thick beds of coal within three and one half feet of each other, both of excellent quality, the upper four and one half and the lower six and one half feet in thickness. The same strata, no doubt, extend over all that part of the county. Fine clay, susceptible of being made into the best of fire bricks, exists everywhere in connection with the beds of coal. Black and gray shale, and superior qualities of building stone (lime and freestone) are to be found throughout the county. At Airdrie Furnace, and many other places, are found beds of limestone so full of sulphuric and phosphoric acids as to be well adapted for the purposes of fertilizing all lands which are deficient in these materials, or are tired or worn out, through a careless system of cultivation. The soils of this county are quite varied; the bottoms and level lands being generally fertile, while the hills and ridges are thin, and sometimes rocky and poor. The general surface of the country is rolling, and sometimes broken. There are, however, along the rivers and creeks, extensive areas of flat lands, which frequently overflow. These, by a proper system of drainage, might be made into excellent corn and meadow farms.

Agriculture.—Corn, wheat, rye, oats, and tobacco are the staple crops of Muhlenburg. Blue-grass will not flourish very well; but orchard-grass, herds-grass, timothy, clover, Hungarian, and millet produce good yields. The tobacco grown in this county, upon the sandstone soil, is similar to that of Henderson and Hopkins counties, while that raised on the carboniferous or cavernous limestone, in the southern part of the

county, is very much of the same character as the "Hopkinsville Shipping Leaf." Grapes, so far as they have been tried, do well, and other fruit of every kind succeeds as well as in any other portion of the State. In live stock this ranks with Hopkins, McLean, and Ohio counties, the old-fashioned scrub breeds being still the general favorites, upon the principle that they can take care of themselves "on the range." Some enterprising farmers, however, are beginning to introduce stocks of horses, cattle, sheep, and hogs, of better bloods, and within a few years we may expect to see the pedigrees of these animals greatly improved. At present large numbers of mules, cattle, and hogs are yearly driven to the markets of the Southern States, or shipped on the cars to Louisville. The rearing of sheep or wool-growing has been kept down by the intrusion of worthless cur and other dogs, that kill off the flocks as fast as they can be brought to a profitable condition. When the dog curse upon this branch of farming can be removed, Muhlenburg will be one of the best wool-growing counties in the State.

Streams and Railroads.—Green river skirts the entire northeast border of the county, and affords slack-water navigation the entire year for steamboats to all the northern, eastern, and central parts of the county. Pond river runs along the western border, and affords navigation for flat and keel boats, and could easily be made navigable for steamboats by means of locks and dams. It also affords fine sites for mills, furnaces, or factories. Mud river forms the southeast boundary, giving good navigation for flat-boats and keels, and could also be improved by locks and dams. The other principal streams are Big and Little Clifty, Otter, Plum, Long, Mill, Pond, Jarolie, Elk Pond, Log, Thompson's, and Cane creeks, several of which afford good mill-sites and water sufficient for saw and grist-mills. The Louisville and Paducah Railroad runs nearly centrally through the county from east to west, and the Owensboro and Nashville Railroad centrally through from north to south. This latter, however, is completed only from Owensboro to the crossing of the Louisville and Paducah Railroad, four miles east of Greenville. When the O. & N. road is completed, every part of the county will have easy and daily facilities for freight and passengers to all points north, south, east, and west.

TOWNS AND VILLAGES.

Greenville, the county seat, is located about the centre of the county, on the Louisville and Paducah Railroad, and, besides the usual public buildings, has half a dozen fine churches, three academies, four tobacco

factories, grist and saw-mills, a bank, tannery, a dozen mechanic shops, and several elegant, well-appointed private residences. It contains a population of about 1,200 intelligent, enterprising, thrifty citizens.

South Carrollton, on the west bank of Green river, is a handsome town of about 500 inhabitants. It does a very large shipping business by the boats, and also by the Owensboro and Nashville Railroad, which passes through it.

Skilesville, at the mouth of Mud river, near dam No. 3, is a neat village of 100 inhabitants.

Paradise, on Green river, 10 miles above South Carrollton, is a thriving town of about 300 inhabitants. It is about two miles from Airdrie iron furnace.

Stroud City, at the junction of the Owensboro and Nashville with the Louisville and Paducah Railroad, is a thriving town of about 200 inhabitants.

Bremen, 14 miles northwest of Greenville, is a pleasant village, with a population of 100 persons.

Nelson Station, *Mercer Station*, *Gordon*, *McNary*, *Laurel Bluff*, *Lead Hill*, and *Earles* are small places, each of which does the general traffic of its neighborhood.

Domestic Arts and Manufactures.—The intelligent, industrious, energetic ladies of Muhlenburg still continue to manufacture at home, on the wheel and hand-loom, most of the cloth needed for every-day wear. Whatever surplus they have is traded to the country merchant, as are also large amounts of beeswax, eggs, poultry, dried fruit, feathers, butter, ginseng, home-knit socks, maple sugar, and tree molasses. There are no large amounts of capital invested in manufactures; still, large quantities of sawed lumber, staves, logs, and manufactured tobacco are exported every year from Greenville and other places in the county; and the great abundance of coal, timber, and raw material produced in this county ought to make it one of the leading manufacturing sections of the West. Millions of bushels of coal are mined and exported to Louisville and elsewhere every season, and enterprise and capital might start up any number of first-class iron furnaces and rolling mills, which could find here ore and coal enough to last them for a thousand years.

Schools and Churches.—There are three first-class academies in Greenville, and several private high schools elsewhere in the county. Besides these, the free common schools, under the State system, are taught in every district; so that every child in the county can receive a good edu-

cation at but little cost, unless detained from the schools by its parents or guardian. The Hard-shell Baptist, the Missionary Baptist, the Methodist, the Presbyterian (Regular and Cumberland), the Catholic, the Universalist, and Reformer are the principal Christian denominations. The church buildings are mostly good, and the members generally devoted workers in the faith they have adopted. The ministers are usually well instructed, eloquent divines, who are very popular with their congregations. Their salaries, though not extravagantly large, are paid promptly.

The People are remarkably intelligent, honest, industrious, and hospitable. They are anxious to have emigrants from other countries come and aid them in developing the great coal, mineral, and agricultural resources of their county; and to all such will extend a most hearty welcome. The lands are very cheap.

NELSON COUNTY.

This was one of the counties formed out of the territory of Kentucky by the General Assembly of Virginia in 1784, being the fourth county so formed. It was taken from a part of what was then Jefferson county, the State having previously been divided into Jefferson, Fayette, and Lincoln counties. It at first embraced all the territory between Salt and Green rivers as far eastward as the east border of Washington county. It has, however, been trimmed down, until now it is bounded on the north by Bullitt and Spencer, east by Anderson, Washington, and Marion, south by Washington, Marion, and Larue, and west by Larue, Hardin, and Bullitt. It has been mutilated and cut in till now it has no particular shape, and does not correspond in any of its boundary lines with any of the cardinal points of the compass.

Geology and Soil.—This county is quite varied in the formation of its rocks, reaching from the lower Silurian on its northern and eastern borders, through the upper Silurian to the Devonian shale and knobby hills, and to the Waverly series on the south and west. The surface of the country is generally undulating, with much excellent soil; but in the

southern parts the soil is thin, sometimes "sobby beech," and knobby hills. The blue ash lands of this county are famous for their great fertility, and chemical analysis places them among the most fertile lands derived from the upper Cambrian or lower Silurian rocks. They are remarkable for the large amount of phosphoric acid they contain, which evidently is derived from the numerous fossil shells, with which the original rocks (from which these lands were made) were charged. They also abound in alkalies and potash, and, if judiciously cultivated, ought to remain for centuries very little impaired in their productive powers. Where the magnesian limestone prevails, in the upper Silurian, can be found the best white oak timber for boat-wheels or wagon spokes in the west. These lands are also excellent for wheat. Throughout the black Devonian shale formation is found iron ore, in strata of twelve to sixteen inches thick, which can be delivered at the furnace at one dollar per ton. The amount of this ore will well repay working, and, if judiciously handled, would make the iron industry in this county a source of great wealth. There is no coal in Nelson, but a black shale is found of over forty feet in thickness. There are also several strata of good hydraulic cement rock, and numerous salt and mineral springs, of excellent water. Probably no portion of the State would be more benefited by tile-drainage than the sobby beech lands of Nelson county. In several places a marly shale (grey or greenish colored) outcrops, which could be advantageously used as a mineral fertilizer in connection with bone-dust or superphosphates, but by itself it would be deficient in phosphoric acid, one of the chief elements used by nature in the production of vegetable *seeds* of all kinds.

TOWNS AND VILLAGES.

Bardstown, the county seat, is most beautifully located near Beech Fork, about the centre of the county. It has a population of over two thousand, is the terminus of the Bardstown Branch of the Louisville and Nashville Railroad, and contains a fine court-house and other public offices, five or six elegant churches, several factories and mills, a dozen mechanic shops, three large well-conducted academies, and many handsome private residences.

Bloomfield is a well-built town of over 500 inhabitants, twelve miles northeast of Bardstown.

Fairfield has about two hundred people, and is a place of considerable trade.

New Haven, on the Lebanon Branch of the Louisville and Nashville Railroad, has a population of one hundred and fifty persons, and does a large export business in timber, staves, leather, tobacco, iron, &c.

Chaplin, Boston, Deatsville, Gethsemane, High Grove, Hunter, New Hope, Nazareth, Sayers' Station, and Cox's Creek are all thriving villages, each doing a considerable local trade.

Factories, Distilleries, and Furnaces.—The furnaces erected in this county make an excellent quality of tough iron, and show conclusively that the ores are well worthy of extensive working. The fine white oak and other timbers have caused factories to be established for making spokes, hubs, felloes, axe-handles, barrels, and other wood work, and there are ample materials for many other such factories. Woolen mills, grist and saw-mills, and wood shops are located in different parts of the county. The "Nelson County Whisky" has a national reputation, and by many is preferred even to the "Bourbon County" make. It has less of the creosote taste and smell, and more of the native flavor of the grain. It is said to be a remarkably healthy beverage, and is frequently prescribed by physicians in cases of indigestion, lassitude, dyspepsia, and as a tonic; and, contrary to the old adage, "a doctor never takes his own prescription," they frequently take this with satisfactory results.

Schools.—No county in the State is better supplied with good schools than Nelson. At Bardstown are three first-class academies, whose patronage and reputation are co-extensive with the Ohio Valley. The Nazareth Female Academy, under the control of the Roman Catholics, is a first-class institution, ably managed and well patronized. It is probably the largest female institution of the kind in the State. Rev. J. V. Cosby, a fine scholar and teacher, conducts the Presbyterian school; and the Rev. Dr. Kirtly, an able divine and teacher, is at the head of the Baptist institution. Besides these, there are several other private schools of high merit, and the State free common schools, which are taught in every district.

Religion.—The Catholics are the most numerous Christian denomination; then the Baptist, Reformer, Presbyterian, Methodist, and Episcopalian. The church buildings are generally fine specimens of architectural skill, and the congregations attending them are large and intelligent.

Crops and Fruit—Hemp, tobacco, corn, wheat, rye, oats, and barley are the principal staples. Blue-grass grows finely, and timothy, herdsgrass, orchard-grass, clover, Italian rye grass, Hungarian, and millet are

cultivated for hay crops and pasturage. Some of the blue ash lands produce the largest yields of hemp, corn, wheat, and tobacco raised in the State; but much of the lands in the county, in order to do their best, will have to be tile-drained and fertilized with chemical manures. The knobby hills are well adapted to all kinds of fruits, which scarcely ever fail to produce full crops. Vineyards, so far as they have been tried, pay largely; and crops of grapes, of over 10,000 pounds per acre, can be raised where care and drainage are properly used.

Live Stock.—Some of the finest bloods of horses, cattle, sheep, hogs, and poultry, to be found in Kentucky, are to be met with in Nelson county. Scrub stock of all kinds has long since disappeared, and now only the best pedigrees are recognized by the wise farmers. The fine blue-grass and superior grain produced in this section give tone to the breeds of stock, and cause them to mature to perfection. A large business is done in butter, cheese, milk, lambs, poultry, eggs, feathers, &c., for the Louisville market; and the people are every year more and more becoming impressed with the necessity of cutting up their large plantations into small farms, upon which can be produced vegetables, fruits, poultry, sheep, and the products of garden farming generally, for the greatly increasing Louisville and Cincinnati markets. Bee-culture is most lucrative when properly attended to, and there is no part of the west where bees find a greater variety of trees, plants, and flowers from which to extract honey than in Nelson.

Social Characteristics.—In no part of the western country is there a more refined, intelligent, industrious, social, and hospitable population than in this section of Kentucky. Although there is much wealth and many old families in this county, there is none of that aristocratic feeling or purse-proud intolerance which is so frequently found in the old settled parts of the United States. Here every man is considered a gentleman, and his honorable position in society, business, or politics comes from his energy, high-toned moral worth, intelligence, and gentlemanly bearing towards his fellow-men in every relation in life. The female portion of the community are highly educated and refined, and happily adorn the homes of their husbands, fathers, and friends. Immigration coming to the State, seeking new settlements, would do well to try Nelson county, if they desire to locate among hospitable neighbors, and have all the surroundings to make home happy.

NICHOLAS COUNTY.

This county was formed in the year 1799 out of parts of Bourbon and Mason, and named in honor of Colonel George Nicholas. At present it is bounded on the north by Harrison, Robertson, and Fleming, east by Fleming and Bath, south by Bath and Bourbon, and west by Bourbon and Harrison counties.

Streams and Water-power.—The Licking river passes in a northwest direction through the county, after it forms a part of the northeast boundary line. This stream is navigable for rafts and keel-boats, and, if properly supplied with locks and dams, would afford good steam-boat navigation. Hinkston creek, Somerset, Cassady, Beaver, Brushy Fork, and Flat creeks are good mill streams, upon which are several fine sites, with good water-fall.

Geology and Soil.—This county lies entirely within the "Blue Grass Region" of the State, and is based on the upper Cambrian and lower Silurian rocks. That portion of the county which lies next to Bath and Bourbon is rolling and exceedingly fertile, producing hemp, corn, and blue-grass to perfection. The parts next to Fleming and Harrison are less fertile, and more inclined to be broken. These latter lands are covered with a native growth of oaks, and in some places are the formations of mud-stone, or a yellowish sandy limestone, which accompanies the sobby beech lands in Boone, Pendleton, and Gallatin counties. These oak lands, though not so good for hemp, produce excellent corn, small grain, and tobacco. The general surface soil is a dark loam, with a subsoil of red or reddish brown clay, and in the thinner soils a more yellow clay. There are numerous mineral springs in this county, the most noted of which is the famous lower Blue Licks.

Agriculture.—The leading staples are corn, wheat, hemp, oats, rye, hay grasses, blue-grass, and tobacco, all of which seem peculiarly suited to the climate and soil of Nicholas. The fine blue-grass pastures and heavy corn crops naturally make this one of the best stock counties in Kentucky; and accordingly we here find the very best bloods of horses, jacks, cattle, hogs, sheep, and poultry. Racing and trotting horses are highly prized, and great pains are taken to secure the most noted pedigrees in breeding, as exhibited in the turf books of this country and England. The favorites in cattle are the Short-horn, Devon, and Alderney;

in sheep are the Cottswold, Merino, and Shropshiredown for wool, and Southdown for mutton; and in swine the Berkshire (red and black), the Poland-China, the Essex, and Chester-White; in poultry are the light Bramah, Spanish, game, and old dominique. Sheep husbandry is quite remunerative, but the great mass of farmers pay more attention to raising mules, cattle, and blooded horses. Large numbers of these are every year brought into the county for the purpose of grazing and fattening, and then exported to the Cincinnati and New York or Southern markets. Bees do well, but very little honey is produced in this county, except for home consumption.

TOWNS AND VILLAGES.

Carlisle, the county seat, is located about the centre of the county, on the Maysville and Lexington Railroad, 33 miles from Maysville. It contains a good brick court-house and other public offices, a beautiful public square, five churches, the Kentucky Normal School, grist and saw-mill, woolen factory, a dozen mechanic shops, many elegant private residences, and about 800 inhabitants.

Moorefield, 6 miles east of the county seat, is a nice village of 100 inhabitants.

Lower Blue Licks is a village located at the celebrated Blue Lick Springs, formerly one of the most frequented and fashionable watering-places in Kentucky.

Oakland Mills, Chapel, Headquarters, and Morning Glory are all handsome, thriving villages.

Transportation and Traveling Facilities.—This county has no rivers for steamboats, but has the Licking, on which rafts and keel-boats pass to the Ohio. The Maysville and Lexington Railroad passes centrally north and south through the county, and the Kentucky Central just touches the southwest corner, so that every neighborhood has daily communication to all points south and north.

Domestic Arts.—Very little cloth, even for home wear, is now made in this county, the people considering that it is cheaper for them to raise farm products and live stock, and to buy all kinds of clothing. The ladies in some neighborhoods, however, trade home-knit socks, poultry, eggs, feathers, beeswax, maple sugar, and tree syrup to the country merchants for dry goods and groceries. Most of the agricultural implements and machinery used here come from Ohio, although some of the best oak and hickory timber in the State is to be found in different parts of the county. But this habit of buying articles manufactured abroad,

which could be just as easily made of the raw material at home, and much more cheaply, is not confined to Nicholas, but is common all over the State, even at the very doors of our largest towns and cities. We trust, however, our people will, after awhile, gain wisdom on this and other similar points.

Schools.—The “Kentucky Normal School,” an institution under the able management of Prof. T. C. H. Vance, is located at Carlisle, and has a considerable reputation for preparing persons to become accomplished teachers. The free public schools, under the State system, are taught in every district, and the people take great pride in having their children attend regularly, and accept all the advantages that can be derived from these institutions. There are also several good academies and private schools in the county, where the higher branches of a liberal education are taught to those desiring a more thorough scholarship than can be had at the free schools.

Churches.—The Catholic, Episcopalian, Methodist, Baptist, Reformer, and Presbyterian are the predominant religious societies, but there are also some Unitarians, Universalists, and Swedenborgians scattered through the community. The church buildings are generally fine—some of them elegant specimens of architectural skill. Every neighborhood has from one to three of these buildings, so that the people find no difficulty in having convenient places to worship, each according to his own faith.

Social Characteristics.—The people of Nicholas are eminently social, educated, and hospitable. They are quite progressive in the various employments of farming, stock-raising, and commerce, and almost every farmer is an excellent trader in stock. They have had comparatively very little immigration or emigration in this county for a series of years, so that there is a great homogeneousness of population, which is of the true Kentucky type. The interior position and rich lands have combined to concentrate an agricultural wealth and social independence not to be met with, except in a community similarly situated; but the railroads are gradually wearing off the old land-marks, and the people are becoming more cosmopolitan in their ideas and association. Emigrants seeking first-class homes and society will find them here.

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OHIO COUNTY.

From a part of Hardin this county was formed in 1798, and named after the Ohio river, which was the original boundary of the county from Cloverport to the mouth of Green river. It is now bounded on the north by Daviess and Hancock, on the east by Breckinridge, Grayson, and Butler, south by Butler and Muhlenburg, and west by Muhlenburg, McLean, and Daviess counties.

Geology, Streams, and Soil.—Ohio county is based entirely upon the rocks forming the true coal measures of the Western Kentucky coal field. Nearly its entire area is underlaid with bituminous coal, accompanied with fire-clay and iron ores similar to those of Muhlenburg and Hopkins. The extent of the coal and iron is but imperfectly known, since no furnaces have been erected, and but little coal mined, except for the use of the country blacksmith shops and family homes of a few citizens in Hartford, wood fuel being so plenty and cheap as to supply the current demand. The general surface of the country is rolling, sometimes hilly, and in many places broken. Along Green river and Rough creek are extensive bottoms or flats, subject to overflow. A proper system of drainage, and possibly some levying, would make these lands first-class for corn and hay. The sandstone of the coal measures prevail so extensively over this county that the soil appears in many places to be deficient in lime, which might be supplied by broadcast sowing of carbonate of lime (common lime) or gypsum (sulphate of lime) with great profit. Green river, which forms a large part of the Southern boundary, is navigable for steamboats all the year by means of locks and dams. It is a beautiful stream, abounding in fish and skirted with bottoms, containing the largest and some of the best timber forests in the State. Rough creek runs centrally through the county from northeast to southwest, and also forms a portion of the southwest boundary. This stream has been frequently navigated by small steamboats as high up stream as Hartford, the county seat, and, by a proper system of locks and dams, can be made navigable much higher. Above Hartford it forms a fine mill stream, with many sites suitable for furnaces or manufactories. Panther creek, Rock Lick, and Beaver Dam are fair mill streams. The soils along the river and creek bottoms, and on the level lands, are very fertile, as are also much on the ridges; but in parts

of the county there are broken sandy ridges which are less rich in plant food; these, however, generally have beds of coal, very easy of access, and also abound in the best quality of hard, useful timber. Nature has particularly blessed Ohio county with forests such as are to be found in but few other countries. Here grow in great luxuriance all kinds of oaks, poplar, cypress, gum, sugar tree, walnut, butternut, hickory, maple, ash, elm, cucumber tree, wild cherry, locust, redbud, hackberry, sycamore, wahoo, sassafras, beech, birch, linden, iron-wood, chestnut, cotton-wood, black-jack, hornbeam, &c., &c., with a heavy undergrowth of papaw, spice-wood, dogwood, creepers, grape-vines, peavines, cane, &c.

TOWNS AND VILLAGES.

Hartford, the county seat, is handsomely located on the east bank of Rough creek, about the centre of the county. Besides the usual public buildings, it contains five or six elegant churches, tobacco factories, grist and saw-mills, wool-carding factory, two academies, half a dozen mechanic shops, and many excellent, well appointed private residences. It has a population of about 800 persons, and bids fair to increase rapidly as the country is developed, and its advantages as a manufacturing point become better known.

Rockport, at the crossing of the Elizabethtown and Paducah Railroad over Green river, is a well-located, flourishing town of 250 inhabitants. This place is peculiarly well located for a manufacturing town, surrounded, as it is, by inexhaustible beds of coal and iron ore, a good agricultural country, and a plentiful supply of the best timber to be found in the Mississippi Valley.

Cromwell, with a population of 200, situated on Green river, is quite an important shipping point.

Ceralvo, also on Green river, five miles from South Carrollton, is an important shipping place, particularly for staves and lumber.

Beaver Dam, four miles from Hartford, on the Elizabethtown and Paducah Railroad, is a considerable town, doing a large business in dry goods, groceries, and tobacco. It has a population of about 200, and is rapidly growing.

Buckhorn, *Buford*, *-Coal Spring*, *Fordsville*, *Hines' Mills*, *Point Pleasant*, *Rock Lick*, *Sulphur Springs*, *Centretown*, *Hogfalls*, *Rosine*, *Elm Lick*, *Hamilton*, and *McHenry* are all neat, pleasant villages, each doing the local traffic of its neighborhood.

Agriculture.—Corn, wheat, rye, oats, barley, tobacco, and the hay grasses all grow luxuriantly in this county, and rarely fail of a good average crop. The tobacco is very similar to that of Daviess county, and is sold principally at Owensboro, where it gives character to what is known as “Owensboro Stripping Leaf.” Fruits of all kinds do well, and, so far as vineyards have been tried, they prove a success. No doubt if proper attention was paid to grape culture, and the improved native varieties were planted, that this county could produce wine equal in body and bouquet to any made in Ohio or Missouri. Dr. Pendleton, of Hartford, and others, who have planted the Concord and other hardy native vines, have proved the adaptability of the soil and climate to be well-suited to this industry. In live stock Ohio is an average county. The scrub breeds still hold sway in most of the county, but of late years quite a number of fine-bred horses, cattle, sheep, and hogs have been introduced by the more public-spirited, wide-awake farmers. Large numbers of mules, cattle, and hogs are exported each year, which adds considerable sums to the wealth of the country. The grasses, shrubs, and plants of this county indicate that sheep husbandry might succeed well, and that flocks of long-wooled Cottswolds, Merinos, and Shropshiredowns could be made more profitable than any other class of live stock. Bee culture, too, would do well, and honey-making might be carried on at little or no cost, owing to the large number of trees, shrubs, and plants that naturally produce flowers which supply food for bees. No part of the State can be more benefited by the use of chemical fertilizers than Ohio county, and a judicious use of gypsum, bone dust, superphosphates, salt, ammonia, potash, or German kainit, or the South Carolina marls or nodules, where the soil is worn or deficient in the principles contained in these chemical compounds, would restore the lands, and cause them to produce crops superior to those made when the soil was in its virgin newness.

Schools and Churches.—There are several fine mixed schools and seminaries in this county at Hartford, Beaver Dam, Rockport, Fordsville, &c., besides the free public common schools taught in every district under the system of the State. The school-houses are generally comfortable, and the teachers are becoming more competent and skillful each year. A Teachers' Institute is held annually at Hartford, at which all the instructors assemble, and consult over the best methods of making still further progress in their calling, and also how to advance education in the land. The Old and New School Baptist, the Catholic,

Methodist, Presbyterian, Episcopalian, Reformer, and Universalist are the principal religious sects in the county. The church buildings are generally neat, comfortable structures, well suited to the wants of the intelligent, pious, devout members who worship in them. These "meeting houses," outside of the towns, are scattered throughout the county; so that one or more can be found in every neighborhood. The ministers are usually well educated and eloquent speakers, who are finely posted in the tenets of their respective creeds.

Domestic Arts.—In most neighborhoods the good, industrious, intelligent women follow the old fashion of their mothers, and continue to manufacture at home nearly all the cloth needed by the family for everyday wear. They also market considerable quantities of butter, eggs, poultry, home-knit socks, feathers, beeswax, dried fruit, ginseng, country sugar, and tree molasses. There are not many persons or large capitals employed exclusively in manufacturing, yet there are numerous grist and saw-mills, tanneries, carding-machines, wood-workmen's shops, and various other mechanic shops, in quantity sufficient to supply the general wants of the farming population.

Characteristics of the People.—Like the citizens of the other Green river counties, the people of Ohio are honest, industrious, thrifty, frugal, intelligent, kind, and hospitable. While there are no overgrown fortunes, there is no abject poverty. The court dockets are scant of law-suits, and the county jail is but poorly supplied with inhabitants. The poor-house only exists in name, and but few objects of charity are to be found in the county. The people are nearly all descendants of Virginia and North Carolina planters, intermixed occasionally with some excellent English, German, Irish, or Scotch families. The customs of the kind-hearted, brave, generous, hospitable pioneers are still prevalent; and nowhere can be found selfish aristocratic cliques, such as exist in many old communities in this country and Europe. Intelligence, industry, moral rectitude, and honesty are the only passports to honor or political preferment. The females are refined, well-educated, and endowed with all the requisites of beauty, virtue, and excellence, which so highly adorn the female characters of our Kentucky women. The citizens are anxious to have a greater subdivision of their lands and system of labor, and would heartily welcome emigrants from other States or countries to come among them and share the many advantages which nature has bestowed upon this section of the Green River Country.

OLDHAM COUNTY.

From parts of Jefferson, Shelby, and Henry this county was taken in the year 1823, and named in honor of Col. Wm. Oldham. It is now bounded on the north by the Ohio river, which separates it from Clark county, Indiana, on the northeast by Trimble, on the east by Henry and Shelby, on the south by Jefferson, and west by the Ohio river.

Streams and Water-power.—The Ohio river, which forms the western, northwestern, and northern boundary of the county, gives uninterrupted steamboat navigation the year round. Harrod's creek, Curry's Fork, East Fork, Pond creek, Carr's Fork, and Pontoon creek are the principal streams, upon some of which there is excellent water-power and some good mill-sites.

Geology and Soil.—This county is based upon the upper strata of the lower Silurian, which pass into the upper Silurian, and then into the Devonian sandstones, which outcrop on the highest ridges. There are no coals or minerals of value, except traces of sulphurets of lead in quantities too small to be workable. Some most excellent building stone, both of lime and sand, are found everywhere in the county, and possibly there may be some good clay for coarse pottery ware. The surface of the country along the Ohio river, and in the northeast part of the county, is hilly and broken; the remainder is generally undulating, with occasionally rocky knolls or ridges either of lime or sandstone. The arable lands are good second rate, except on the river and creek bottoms, where the soil is quaternary and very rich. Blue-grass grows well throughout the county, and orchard-grass is well-adapted and grows here as well as in any part of the State; other hay grasses do well. The rocks on the hill-sides and creek bottoms frequently present fine shell specimens of the ancient life status which existed in the primitive oceans, long before mountains and hills were to be found on the face of the globe, or red-blooded animals had been called into existence. Several fine specimens of these rocks are to be found in the State cabinet, presented by Mr. Henry K. Hitt and others.

Agriculture.—Corn, wheat, rye, oats, barley, tobacco, and orchard-grass for seed, are the principal crops raised by the farmers. The orchardists, vine-growers, and gardeners cultivate each their respective plants with marked success, and large quantities of fruit, wine, and vege-

tables find their way from this section into the markets of Louisville, Covington, and Cincinnati. Many of the farmers of this county are experimenting how to preserve their lands, and how to so fertilize them with chemical manures as to produce the largest crops with the greatest certainty and least labor. Mr. H. K. Hitt, Col. W. W. Taylor, ex Gov. R. T. Jacobs, and others, are doing much to elevate the science of agriculture and ennoble the profession of soil-tillage through the experiments made by themselves and the members of their Granges.

TOWNS AND VILLAGES.

Lagrange, the county seat, is handsomely located on the Louisville and Lexington Railroad, near the junction of the Cincinnati Branch, twenty-seven miles from Louisville, and eighty-one miles from Cincinnati. It contains a population of about seven hundred persons, has a fine new court-house, and other public offices, four nice churches, a seminary, a woolen mill, saw and grist-mill, half a dozen mechanic shops, and several neat, well-appointed private residences.

Westport, formerly the county seat, is eight miles from Lagrange on the Ohio river, and is a considerable shipping point. It has a population of one hundred and fifty.

Ballardsville, four miles southeast of Lagrange, is quite a neat, thriving village, of one hundred inhabitants.

Pewee Valley, seventeen miles from Louisville, on the Louisville, Cincinnati, and Lexington Short-line Railroad, is a beautiful town of three hundred inhabitants, mostly wealthy merchants who do business in Louisville.

Brownsboro, *Buckner's Station*, *Beard's Station*, *Peru*, and *Goshen*, are all thriving villages, from each of which the citizens of the respective neighborhoods ship all kinds of farm and dairy products, fruits and vegetables, to the Louisville market.

Garden Farming and Live Stock.—Owing to the proximity of Louisville, the people of Oldham are every year withdrawing more and more from the old plantation system of soil tillage, and entering into garden-farming, fruit-raising, wine-making, poultry-raising, and the production of live stock. Hogs, sheep, lambs, turkeys, ducks, guineas, peafowls, chickens, and pigeons are all sold extensively to the hucksters, who are to be found at every depot ready to receive any of these articles which they may have ready for sale. Butter, milk, cheese, feathers, fruit, and vegetables are also sent daily to the city agents for sale, whereby a large income is brought into the county. Very little spinning, carding, and

weaving is now done in this county, owing to the fact that other branches of farm industry pay better, and the people cannot find time for making cloth at home. A great deal of fine-blooded stock, horses, mules, cattle, hogs, sheep, and poultry is raised in Oldham, and sold in the Louisville market. The sheep of this county are equal to any in the United States, either as wool-bearers or for mutton. This is owing to the peculiar adaptation of the shrubs and grasses grown upon the lands of this geological formation. These supply the acid or bitter principles which contribute so largely in giving health and fecundity to sheep. The mules of this county are among the best for toughness and hardihood raised in Kentucky.

Schools.—There is an excellent seminary of learning at Lagrange, and the "Kentucky College for Young Ladies" at Pewee Valley, and several private schools in the county, besides the common free school system of the State, which has been inaugurated in every district; so that every child, whose parents will send it to school, can easily obtain a good common education at very little cost. A large number of the young men and ladies are also sent off from the county to the colleges and academies of this and other States.

Churches.—The Baptist, Methodist, Catholic, Reformer, and Presbyterian are the principal religious denominations, with an occasional sprinkling of members of other churches, such as Episcopalians, Unitarians, Lutherans, Universalists, and Swedenborgians. The church buildings are generally good, and some of them elegant. The church people are steady believers and workers of good, but not bigots or enthusiasts, and generally think more of good, honest morality than of flowery sermons and the dicta of high-salaried preachers.

Social Characteristics.—The Oldhamites are remarkable for their intelligence, high, chivalrous bearing, ease of manners, and genial hospitality. The women take pride in the display of their excellence, their knowledge and practice of the arts of cooking, fruit-preserving, and house-keeping; and the matrons always say of their daughters, when the gallants are about, "they understand the affairs of the kitchen and the management of the house even better than we do," which is certainly saying a great deal, when a guest looks at the neatness that characterizes all parts of the domestic homestead. Emigrants from other States or countries, who desire good society and facilities of good markets, both in Louisville and Cincinnati, will find a hearty welcome and a good place for settlement in Oldham.

OWEN COUNTY.

"Sweet Owen" was cut off from parts of Scott, Franklin, and Gallatin counties in 1819, and named in honor of Col. Abraham Owen. It is bounded on the north by Carroll, Gallatin, and Grant, on the east by Grant and Scott, on the south by Scott, Franklin, and Henry, and west by Henry, Carroll, and Gallatin counties.

Geology, Streams, and Soil.—Owen county is located entirely upon the lower and upper Silurian limestone rocks. This group consists of a great number of strata, many of which are very thin, and quite easy of disintegration. This causes a considerable variety of soils to exist in the county, as the one or another of these strata is brought to the surface. Many of these soils are equal to those of Fayette and Woodford, while others are inferior. The general surface of the country is undulating, some of it hilly, and in places quite rocky. There are no minerals in Owen, unless, perhaps, small quantities of lead ore and barytes may be found associated with the "bird-eye" strata of the lower Silurian formation. In some parts of the county the mud-stone stratum comes to the surface as it does in Boone, Gallatin, and Grant, and forms the "sobby beech" lands. These can be greatly benefited by subsoil tile-drainage, so as to become exceedingly valuable for corn and grass. The oak and hickory ridge lands are the best for tobacco, and the marly fossiliferous rocks give the best soils for hemp, corn, and blue-grass. Owen is one of the best watered counties in Kentucky. The Kentucky river forms its entire southwestern boundary for about thirty miles, and is navigable by means of slack-water throughout the year. Eagle creek rises in Scott county, flows northwardly through the southeastern part of Owen; thence along the eastern border of the county till it reaches Gallatin, when it turns southwest, and forms the boundary between Owen and the two counties of Gallatin and Carroll, until it empties into the Kentucky. The tributaries of Kentucky and Eagle creek are Big Twin, Little Twin, Cedar, Big Indian, Caney, Clay Lick, Severn, and Pond creeks. Most of these streams are large enough to afford water for mills and factories. Although the lands are rolling and hilly, yet the soil is generally rich and well-adapted to blue-grass, tobacco, and all the cereals.

TOWNS AND VILLAGES.

Owenton, the county seat, is handsomely located about the centre of the county, in the midst of a rich body of lands. It has a fine brick court-house and other public offices, three or four churches, a bank, tobacco factory, grist and saw mill, tannery, more than a dozen mechanic shops, and many elegant residences. It contains about four hundred inhabitants.

New Liberty, eight miles northwest of Owenton, is beautifully situated in a rich section of the country, and contains a population of four hundred.

Dallasburg, four miles from the Louisville and Cincinnati Railroad, is one of the neatest villages in the State.

Monterey (Williamsburg), near the Kentucky river, is quite a pretty village.

Lusby's Mill, *Gratz*, *New Columbus*, *Poplar Grove*, *Eagle Hill*, *West Union*, *Harrisburg*, *Sweet Owen*, *Canby*, *Rockdale*, *Harmony*, *East Eagle*, *Pleasant Home*, *Greenup Fork*, *Squirrelville*, and *Port Royal* are small places, located in different parts of the county, each doing the necessary traffic of its neighborhood. The Louisville and Cincinnati (Short-line) Railroad skirts Owen county on the west, and the Cincinnati Southern Railway on the east, each running for many miles in sight of the county, but not upon its territory.

Agriculture.—Owen county is famous for its fine cutting leaf tobacco, which is raised upon the oak and hickory ridges. There is no section of Kentucky where this class of the weed grows so universally perfect in texture, body, and color. It also excels in corn, wheat, oats, and rye, and is the peer of any adjacent county in all kinds of fruits and vegetables. Pears, apples, peaches, plums, and cherries grow most luxuriantly, and rarely ever fail of a full crop. Vineyards, so far as they have been tried, do fully as well here as they do in the State of Ohio. The improved native varieties suit the soil and climate much better than the vines imported from France or Germany. This industry, if extended to wine and brandy-making, would no doubt prove highly profitable. (See Wine-making, under the head of Washington county.) The rich, succulent grass, the heavy corn, and the fine hay crops of this county, naturally make it one of the best stock sections of Kentucky. Here we find only the best bloods of horses, jacks, cattle, sheep, hogs, and poultry. Racing and fast trotters are quite common, and fancy Short-horns and Alderney cattle, and Cottswold, Merino, and Southdown sheep, for wool

and mutton, are to be found in every neighborhood. Some of the choice long-wool sheep will weigh between three and four hundred pounds. Bees do well, owing to the great abundance of white clover and other honey-producing plants. This industry (honey-making) might be increased indefinitely at but little cost, and would doubtless prove exceedingly profitable on the capital invested.

Smaller Industries.—The old fashioned plan of clothing the family from cloth made at home has not entirely disappeared from this part of Kentucky. In some neighborhoods the ladies still spin and weave, and supply a large proportion of the family expenses from the surplus of cloth, dried fruit, home-knit socks, eggs, poultry, feathers, beeswax, maple sugar, and tree molasses, which they produce at home and traffic to the country merchants. There are no large amounts of capital in this county employed in the business of manufactories, still there are a number of saw and grist-mills, tanneries, wool-carding machines, agricultural implement and mechanic shops, which do the necessary work of the farming people. Owing to the close proximity of the Covington, Newport, and Cincinnati markets, this county is fast changing from the plantation system to that of garden-farming. The large landed estates are being subdivided, and a larger number of freeholders are beginning to cultivate the soil, so as to supply fruit, berries, melons, vegetables, grapes, ducks, chickens, eggs, turkeys, pigs, lambs, and the thousand and one articles which usually are sought after by the hucksters, who frequent the railroad depots in order to supply the city markets. This class of farming will prove much more lucrative to the land-owners than the old system, and give a more stable and certain income.

Schools.—Concord College is located at New Liberty. It is under the control of Prof. H. J. Greenwell and a corps of able assistants. It confers degrees, and has both a male and female department. The public school of this district is taught in connection with the college. At Owenton are two well-managed academies. Other private high schools are located in different parts of the county, in addition to the free common schools taught in every district under the State system.

Characteristics of the People.—The citizens of Owen are distinguished for their intelligence, bravery, high-toned honor, and true native hospitality. Probably as many persons went to the Southern army in the late civil war from Owen as from any county in the State in proportion to population. These people have always been for "equal rights to all and exclusive privileges to none;" therefore they politically oppose all

tariffs, all special taxation, all standing armies, and large navies and custom-houses. They are unequivocally against monopolies of all kinds, and never fail to vote upon the side that will give the greatest privileges to the greatest number. Being hard working, industrious, intelligent American freemen, they cannot understand those quirks and policies that place all the money-making and money-regulating powers of the nation in the hands of a few bond-holders, upon the false idea of a "financial policy." Their steadfast adherence to principles over policy has caused this county to take the appellation among the Democracy of the country of "Sweet Owen," which we trust she will ever hold, until her principles of equity and justice shall become the established rule in our land.

Churches.—The Methodist, Catholic, Baptist, Presbyterian, Episcopalian, and Reformer are the principal religious societies. The church buildings are generally good, well-built, and commodious, the congregations large, and the ministers usually well educated, eloquent speakers. As a rule, their salaries are not very great; yet they are promptly paid, and sufficient for a good support.

OWSLEY COUNTY.

This county, named in honor of ex-Governor William Owsley, was formed in 1843 from parts of Clay, Estill, and Breathitt, and is bounded on the north by Lee, east by Breathitt and Perry, south by Clay, and west by Jackson county.

Geology, Minerals, and Soil.—Owsley county is almost entirely based on the rocks of the true coal measures, and abounds in coal of excellent quality. Iron ores, in conjunction with the stratification of shale, are frequently met with in large quantities, which will some day be worked at a profit. The surface of the country is rolling, hilly, and rough. The lands along the river and creek bottoms are very rich, but on the hills and ridges thin, frequently sandy and rocky, and better adapted for vineyards and sheep husbandry than for the cultivation of tobacco and the cereals. The iron ores are of the same kind as those

of Wolfe, Perry, and Estill counties. Fine lithographic stone, susceptible of a good polish, and very similar to that of Estill county, exists in quantities said to be inexhaustible. Lead ore has also been found, but probably not in paying quantities. Good building stone exists in great abundance, and forests are everywhere to be seen of the largest and best workable trees indigenous to this latitude. When the Kentucky river is made navigable to the Three Forks, and the South and Middle Forks made navigable by slack-water, the coal and iron of this county will become invaluable.

TOWNS AND VILLAGES.

Booneville, the county seat, is handsomely located on the south side of South Fork of Kentucky river, in the northern part of the county, and contains about 150 inhabitants. It has a good court-house, an academy, saw and grist-mill, and several mechanic shops.

South Fork, *Traveler's Rest*, and *Island City* are neat, flourishing villages, each doing a considerable local trade.

Schools and Churches.—There are several private schools in the county. The State common school system has been inaugurated, and there has been a free mixed school taught in each district of the county. The people show a commendable interest in having their children educated, and the schools are generally well attended. The Iron-clad Baptist, the Methodist, Free-will Baptist, Reformer, and Universalist are the principal denominations of Christians. The church buildings are plainly built of logs, or are framed and weatherboarded; but they answer well the purposes of those who seek truth, and not the latest fashions of dress and style. The people have no use for high-sounding sermons, made by men who preach for money, but listen attentively to those who do the work of love, and bring the rich offerings of peace and good will among men. Every neighborhood has one or more meeting-houses.

Crops and Fruits.—On the creek and river bottoms fine corn, wheat, oats, rye, and potatoes are raised; but the crops on the ridge lands are much lighter. Fruit, however, grows well on all the hills and ridges, and grape-vines produce heavy yields. Vineyards would prove highly profitable if properly cared for. Peanuts or "goobers" would be an excellent crop for profit, and would pay here as well as in Dixon county, Tennessee, or in the Kentucky Purchase, where they are as profitable as tobacco. Flax also would be a good paying crop, both for the seed and lint, and might be cultivated largely, particularly since the new patented brake, which cleans over a thousand pounds a day at little cost, could be made to take off the heavy labor of preparing the lint for market.

Live Stock.—But little enterprise has been shown by the farmers in improving their stock, consequently the scrub breeds still predominate. The wild pasturage is excellent for cattle, hogs, and sheep, and these animals usually gather their own living "in the woods." The mast is generally sufficient to carry the hogs through the winter, and the wild grasses and pea-vines make the cattle and sheep very fat during the spring, summer, and fall months. With good breeds, Owsley would become an excellent stock county, particularly in sheep, which seem to flourish here equally as well as in any part of the continent.

Streams and Water-power.—The South Fork of Kentucky river runs centrally from south to north through the county, and the Middle Fork runs through the northeast part. These, with their branches, have fine water-fall, and afford many good sites for mills, furnaces, and factories.

Domestic Arts.—There are several grist and saw mills in the county, but the chief manufacturing is done by the industrious, energetic women, who still continue the use of the cards, spinning-jennies, wheels, and hand-looms, and make nearly all the cloth worn by their families. They also trade for "store goods" and groceries large quantities of linseys, jeans, cottonade, home-knit socks, counterpanes, blankets, poultry, eggs, butter, beeswax, feathers, dried fruit, maple sugar, tree molasses, and ginseng root. The "seng business" is followed by the women and boys at certain seasons of the year with considerable profit. It is estimated that a good "seng digger" with his hoe ought to make from one to two dollars a day in the hill country.

The People.—The citizens of Owsley are kind, hospitable, and generous, and nothing pleases them better than to have strangers come among them, either as visitors or settlers, and they take great pleasure in showing the vast riches which nature has stored by in their country in the form of iron ores, coal beds, mineral waters, and large forest growths, all of which will some day be sources of immense wealth. What this country most needs is a railroad to bring it into the highways of trade, so that its timber, coal, and iron can be made available. The people are fond of hunting and fishing, and their country abounds in game of all kinds, and excellent brook and mountain trout are to be found in the streams. Parties from the neighboring counties frequently go here on camp hunts, in which they are frequently quite successful.

PENDLETON COUNTY.

In 1798 this county was cut off from parts of Bracken and Campbell, and named in honor of Edmund Pendleton. It is bounded on the north by Kenton and Campbell, and for about five miles by the Ohio river, east by Bracken, south by Harrison, and west by Grant county.

Geology, Streams, and Soil.—The upper Cambrian or lower Silurian rocks underlie this entire county. The strata of this formation are numerous, and, being thin, are easily disintegrated; this gives quite a variety of soils, as one or another stratum comes to the surface. The prevailing rocks, which give character to much of the soil, are usually of a buff color, with but few fossils. They have no palpable grains of sand, but have a large proportion of silex, and a small per centage of lime, with a considerable amount of sulphuric acid. These give rise to a soil quite different from that of the fossiliferous blue limestones of Fayette and Woodford. The best lands on these rocks have a growth of oak, hickory, poplar, and sugar-tree, with some walnut and hackberry on the hill-sides. These rocks are known as the "mud-stones" of the Silurian Group. The upper members of them give rise to the sobby beech lands so prevalent in parts of Gallatin, Grant, and Boone counties. In the northern part of the county the surface is much broken, and these silicious mud-stones come frequently to the top. About the centre of the county the hills are about 325 feet above the Licking. Their base is composed of yellow marly shales, and rough, weathering limestones, alternating with clay and marly shales. These easily wash out, which causes the ravines to gully out quite deep. The soil around Falmouth and southeastwardly is much better, and has a growth of black ash, walnut, shell-bark hickory, red oak, wild cherry, and black locust, and is well suited for corn, rye, oats, and tobacco.

In the northern part of Pendleton, in the white oak country, considerable beds of bog iron ore are occasionally to be met with. The general surface of the country is rolling or hilly. The Licking river runs from the southeast part of the county to Falmouth, near the centre, where it unites with the South Fork, which enters the county on the south side, and runs central northward, till it here meets the main stream, after which they united flow north through the county. Their

tributaries drain the entire county, and give ample water-power for saw and grist-mills. The principal of these are Fork Lick, Kincaid, Flower, Blanket, Willow, Crooked, Richland, Grassy, and Twelve Mile creeks. Along these streams are many thousand acres of the very richest bottom lands. The "sobby beech" lands are susceptible of great benefit from a skillful system of under-drainage with tiles, and can in this way be made first-class for corn and hay. There are several mineral springs of excellent water, which, no doubt, have their source from the calciferous sandstone of the Cambrian Group, whence also the Blue Lick waters of Nicholas county are probably derived.

Agriculture.—The limestone rocks upon which this county is based cause all the lands to yield good crops of corn, wheat, rye, oats, and tobacco; and when properly tile-drained and enriched by chemical fertilizers or barn-yard manures, they are excellent for gardens, vineyards, and orchards. The proximity of the markets of Covington, Newport, and Cincinnati, since the completion of the Kentucky Central Railroad, has forced the farmers to change their old plantation system, for the more lucrative plan of garden-farming, and has induced the land-owners to cut up their large farms to meet the necessity of the case. This has greatly increased the prices of lands, and also the number of free-holders, and given greater life and vitality to the agricultural interests of the county. All along the line of the railroad, which runs along the banks of the Licking and North Fork centrally through the county, are numerous small farms, orchards, gardens, vineyards, and stock farms, devoted entirely to supplying the hucksters, who make regular trips from the city, in order to buy up whatever the garden farmers may have to sell.

TOWNS AND VILLAGES.

Falmouth, the county seat, is handsomely located in an elevated plain at the junction of Licking river and South Licking, near the centre of the county. It contains a good court-house and other public offices, half a dozen fine churches, two academies, grist and saw-mills, tannery, planing-mill, a dozen mechanic shops, and many elegant private residences. The population is about twelve hundred, and rapidly increasing. *Demossville*, *Butler*, *Meridian*, *Boston*, *Irving*, *Catawba*, *Leuingood*, and *Morgan* are neat, thriving villages, located along the line of the Kentucky Central Railway—Each of which is an important depot for the collection of garden and farm products destined for the city markets. The other towns and villages in the county are *Batchelor's Rest*, *Elizabethville*, *Knoxville*, *Gardnersville*, *Dividing Ridge*, *Ash Run*, *Huntsville*,

Salcm, Flowertown, and Motier. The latter is the only shipping point in the county located on the Ohio river.

Domestic Arts.—The citizens of Pendleton now manufacture very little cloth by the old process of the hand-loom. They find it pays them better to cultivate gardens, orchards, and vineyards, and to raise poultry, pigs, lambs, and calves for the markets of Covington, Newport, and Cincinnati. The system of garden-farming and dairying has become so extensively practiced that people now depend nearly altogether on this plan of labor for their profits. In consequence of this, we find here only the best breeds of horses, cattle, sheep, hogs, chickens, turkeys, ducks, peafowls, guineas, and pigeons. What the farmers need, and what they will have, is that class of animals which mature soonest and consume least. It is remarkable what an improvement has been made in these things within the last score of years, all the outgrowth of market facilities. There has been no cheese-making of consequence, owing to the great demand for milk and fresh butter for daily use; but after awhile, no doubt, this industry will be added to the labors of the Pendleton farmers with great profit.

Schools and Churches.—Pendleton Academy, under the able management of Prof. J. Baldwin and several assistants, is located at Falmouth. It has a handsome building, a good lot of apparatus, and is well patronized by the citizens of Pendleton and the adjacent counties. The free public common schools, under the State system, are taught in every district, and the people evince a commendable zeal on the subject of having their children educated; consequently, their daily attendance at the schools is good throughout the county. The Catholic, Methodist, Baptist, Presbyterian, and Episcopalian are the principal Christian denominations. The church buildings are all neat, well-constructed edifices, finely suited for the uses of the good, intelligent, and earnest Christians who worship therein. The ministers are usually well educated popular speakers, who are well beloved by the congregations over which they are called to teach. Their salaries are not extravagantly large, yet they are sufficient for a comfortable support, and are promptly paid. Every neighborhood has one or more church buildings or "meeting-houses," where large congregations assemble every Sabbath.

The People.—The good citizens of this county are noted for their intelligence, thrift, genial hospitality, refinement, and moral worth. They are proud, but not selfish and aristocratic in their notions. There is no religious or political intolerance, but every person is allowed the full and

perfect privilege of thinking, speaking, and acting as he chooses, provided in so doing he does not intrude upon the rights of others. The women are refined, intelligent, and conspicuous for their beauty, virtue, and the many excellencies which usually distinguish the females of Kentucky. As a moral, social, upright community, the people of Pendleton will compare favorably with those of any county in the State. Industry, education, and moral worth alone are recognized as passports to honor and success, and no man who is devoid of these attributes need expect to be promoted. At the present time, Pendleton county has the honor of supplying the State with the Private Secretary of the Governor, Col. A. R. Clarke, who is also the popular member elect to the Legislature, without opposition, from this county.

PERRY COUNTY.

This county, named in honor of Commodore Oliver H. Perry, was carved out of parts of Clay and Floyd in 1820. It is bounded on the north by Breathitt, east by Floyd and Letcher, south by Letcher and Harlan, and west by Clay and Owsley.

Geology, Streams, and Soil.—The entire county is underlaid by the rocks of the true coal measures of the East Kentucky field. The millstone grit and the conglomerate sandstones are very thick, and frequently are found in tall, beetling bluffs along the banks of the rivers and creeks, and always covered with most beautiful flowering laurels and other mountain shrubbery. The coal and iron ores of Perry are immense in quantity, and excellent in quality. They outcrop along all the rivers and creeks in beds that are practically inexhaustible. The surface of the country is hilly and mountainous, and of but little value for agricultural purposes, except along the creek and river bottoms, and some of the rolling ridges. The bottom lands are very fertile, and the poor ridges afford bitter shrubs and native mountain grasses that are admirably adapted to sheep-grazing. No finer wool or better mutton can be produced on the continent than here in Perry, and no other farming industry could be made to pay more handsomely.

This is one of the best watered and best timbered counties in Kentucky. The North and Middle Forks of the Kentucky, which might be made navigable by slack-water locks and dams, pass entirely through from northeast to northwest, and with their numerous tributaries drain every part of the county. The principal of these are Laurel Fork, Cutshin, Hell-for-Certain, Lost, Quicksand, Ball's, Isaac's, Lot's, Williams', Mace's, Leatherwood, Line, King, Kingdom-Come, Poor, Certain, Elkhorn, Rush, Stacy's, Turner's, Old Buck, Canoe, Bohn, George's, Squabbles, and Bull creeks. All these creeks and rivers have good water-fall, and many of them have excellent power and good sites for mills, furnaces, or factories. In no part of the State are there more numerous supplies of brook and mountain trout and other first-class game fish. There are many fine springs and wells of salt and mineral waters.

Agriculture.—This section of the State is sadly in want of transportation facilities, so much so indeed, that the people are discouraged from engaging extensively in any branch of agricultural industry. They plant only corn, wheat, oats, rye, potatoes, flax, and tobacco, sufficient for home supplies, and export very little except furs, peltries, ginseng, and some hogs, sheep, and cattle. The bottoms being very rich, produce fine crops of whatever is planted in them; but on the hills and ridges very little cultivation of any kind of crops is attempted. These hill lands, however, are not entirely valueless; but, on the contrary, are covered with the finest kind of forests of every species of wood grown in the mountainous regions of the north temperate zone, and when cleared, they are well adapted to orchards and vineyards, probably as much so as are similar lands in the mountain regions of Spain or Switzerland. Sheep husbandry could be made very lucrative, and will no doubt in the future be a leading industry of this section of the State. Wild bees are plenty, and furnish ample supplies of honey for the use of the inhabitants, which is taken from the hollow trees of the forests. Sweet and Irish potatoes, cabbages, and goobers or peanuts grow here to perfection, and could be made profitable staples, if it were not for the difficulty of getting them to market. This in a great measure will be remedied if a railroad is ever constructed in this portion of the State.

TOWNS AND VILLAGES.

The people of Perry are too much wedded to the freedom of their mountain home to even desire the presence of large cities or towns in their midst. They love the pure water, and the health giving air, and

the romantic scenery, which are everywhere to be met with, and are satisfied with *Hazzard*, the county seat, with its court-house, its tavern, its church, and blacksmith shop, and stores and groceries. This is their largest town, which is beautifully located upon the banks of the North Fork, about the centre of the county. *Grape-vine*, *Cutshin*, *Hallville*, *Brashearsville*, and *Salt Creek* are small villages, at which the people traffic their peltries, ginseng, and agricultural products.

Domestic Arts.—There are but few manufactures in this county, except what are conducted by the economical, intelligent, industrious women, who keep up the good old fashion, which they learned from their mothers and grandmothers, of using the flax-wheel and distaff, the cotton and wool-cards, the wheel, the warping-bars, and the hand-loom. Every girl is taught how to make the cross and beam the warp, to use the treadle and ply the shuttle, and to excel in making linsey, jeans, cottonades, linen, counterpanes, and huckaback towels and bed-spreads. After supplying the family with these articles, the good ladies traffic the surplus, as well as large amounts of beeswax, butter, eggs, poultry, feathers, home knit socks, dried fruit, maple sugar, tree molasses, and ginseng, to the country merchants, in exchange for "store goods," "spun truck," fancy dresses, ribbons, jaunty hats, hoop-skirts, groceries, and whatever other articles may be essential for their comfort and Sunday apparel. There are several saw-mills in the county, and a sufficient number of grist-mills to supply the wants of the people.

Schools and Churches.—The free common public school system of the State has been inaugurated in this county, and through the energy and perseverance of the worthy School Commissioner of the county, Thos. F. Johnson, schools are now taught in every district, and the people are beginning to better understand the necessity of educating their children. The attendance at the schools by the children is not altogether so good as it should be; but it is better than formerly, and will, no doubt, improve each year. The Hard-shell Baptist, the Methodist, the Reformer, and Regular Baptist are the principal religious sects in the county. The church buildings, or "meeting-houses," are of humble pretensions, being mostly made of logs and covered with clapboards; but they are well suited to the wants of the honest, intelligent Christians who meet here to worship in faith and in truth, and not to sit on cushioned seats, and gaze at highly-painted, frescoed ceilings, or to listen drowsily to fixed-up sermons, delivered by high-salaried preachers from gilded pulpits.

Popular Characteristics.—The citizens of Perry are honest, intelligent, economical, kind, sympathetic, and hospitable—not having been educated to believe that life consists in a series of quickstep motions necessary in money-making. They take the world easy, and, like true philosophers, do not borrow troubles before they come. They love to hunt and fish, and to enjoy the frolic and sports of a log-rolling, house-raising, a wedding, or a quilting, and will fulfill these innate propensities, even if, by so doing, they may be less active in “speeding the plow.” It is very rarely the case that a temperament will here be made nervous by over-application to the details of business, or that the mental vigor lets down by over-exertion. These people are too much of philosophers to lose the best objects of life by these kinds of perversions; but rather they wisely prefer the other extreme, and allow the world to move forward, and they will be content to follow after. No people anywhere enjoy themselves more than the Perryites. Wheeled carriages, buggies, and wagons are not used as luxuries, because the people have free use of their limbs, if they choose to walk, and thread their way through the bridle-paths of the mountains, if fortune smiles and blesses them with a horse. The women are nearly all intelligent, industrious, and healthy, and make such matrons as Rome could boast of in her best days. Fortunately for mankind, the great streams of population which flow from the mountain counties have such noble mothers. Immigration will yet make this county a most desirable place for a home.

PIKE COUNTY.

Pike county, named for Gen. Zebulon M. Pike, was cut off from Floyd in the year 1821, and is now bounded on the north by Floyd and Martin, on the east and south by the Virginia line (which separates it from McDowell county in that State), on the southwest by Letcher, and on the west by Floyd county.

Timber and Streams.—Like all the mountain counties of Kentucky, Pike abounds in forests of the finest kind of workable timber, such as pine, hemlock, fir, spruce, arbor vitæ, walnut, hickory, poplar, all sorts

of oaks, cherry, mulberry, maple, gum, sugar-tree, sycamore, cottonwood, willow, wahoo, hackberry, beech, larch, linden, ironwood, birch, chestnut, locust, sassafras, persimmon, and a numerous class of undergrowth trees, shrubs, bushes, and vines. Very little of this timber has ever been exported, owing to the want of railroad facilities and reliable water transportation. It is drained by the Big Sandy and its tributaries. The Tug Fork forms the northeast boundary, and the West Fork runs from east to west centrally through the county; each of these branch streams, by means of slack-water, might be made navigable the entire year. As it is, rafts and small boats can only run up them during high water. There are numerous excellent water-falls and mill-sites on these streams and their branches.

TOWNS AND VILLAGES.

Pikeville, the county seat, is located on the south side of West Fork, about the centre of the county. It contains a population of about two hundred; has a good court house, two churches, an academy, grist and saw-mill, half a dozen mechanic shops, and several very neat private residences.

Coal Run, Robinson's Creek, Bent Branch, Little Creek, Cedar, Fishtrap, Ashcamp, Dorton, Mouth of Card, and Mouth of Pond are all small, neat villages, each doing the necessary traffic of its neighborhood.

Minerals, Rocks, and Soils.—This entire county is based upon the coal measures of the East Kentucky coal field, which reaches, on the Virginia line, the ridge of the Cumberland Mountains. Almost the entire surface of the country is underlaid with coal and iron ores. The different coal strata (cannel and bituminous) vary from one foot to seven in thickness, and are of excellent quality. The iron ores are limonites, pot ore, and hydrated oxides of iron, and lie adjacent to the beds of shale and limestone, similarly to the formations in the adjacent counties. As yet these ores have not been worked, owing to the want of transportation facilities.

Agriculture.—Farming is carried on in this county on a smaller scale than in many of the other counties of the State, owing to the mountainous, rough surface of the lands; still the people cultivate corn, wheat, oats, potatoes, vegetables, and fruits, in quantities sufficient for home consumption. The rich valley lands are well adapted to all kinds of cereals; and the hills and ridges for fruits, orchards, and vineyards, could be made very profitable; and if the people could once become accustomed to the industry of brandy and wine-making, they would no doubt

soon establish brands of each equal to those of Spain, Switzerland, or the mountainous cantons of France. Hay grasses do finely on the creek bottoms and level lands, and afford a hay equal to any raised on the continent. But little tobacco has been grown in this county (although the soil is well adapted to its production), on account of the great distance from the markets, and want of railroad facilities, which prevent the farmers from making it a profitable crop. There has been but little improvement in the breeds of live stock.

Schools and Churches.—The public free school system of the State has been inaugurated, and seems to work very well in every district in the county. At Pikeville there is an excellent academy, and in other parts of the county are private schools of good grade. The people pay more attention than formerly to the education of their children, and are fast making the public free schools useful institutions. The principal church denominations are the Iron-clad Baptist, the Methodist, Reformer, Free-will Baptist, and Presbyterian. The church buildings are quite primitive in design, but still supply the demands of the earnest worshipers and seekers after truth, who look not for good works and true piety so much among the rich, proud, and gaudy, as among the meek and lowly.

Domestic Arts.—The people of Pike have never learned the extravagant habits of the richer and more populous counties. Here honest industry outcrops in its native majesty, and the intelligent, frugal, industrious women hold on to the old-fashioned way of manufacturing at home whatever the family needs in the way of every-day wear. The distaff, the flax-wheel, the wool and cotton-cards, the spinning-wheel, and the hand-loom are popular pieces of furniture, which can be found in every household. The young girls and the matrons all know their use, and throughout the pleasant valleys can be heard the merry song accompanying the beat of the loom or the whirling buzz of the wheel. Large quantities of jeans, linseys, cottonade, linens, counterpanes, blankets, and towelings are made and used for the family clothing and outfit, or else traded to the country merchant for "store goods," groceries, "spun truck" (a name given to factory-made thread), and the such fashionable gewgaws as may suit the fancies of the younger people. They also traffic to the country merchants and peddlers eggs, poultry, feathers, home-knit socks, beeswax, ginseng, flaxseed, maple sugar, and tree molasses. There are very few articles made by regular factories in the county, if we except the work done at blacksmith shops, and

about half a dozen mechanic shops, over and above these smaller industries of the ladies.

Habits of the People.—The citizens of Pike are sober, moral, intelligent, honest, and industrious. They also enjoy themselves at every season of the year in hunting, fishing, shooting, dancing, and having co-operative meetings in house-buildings (house-raisings), log-rollings, quiltings, harvest feasts, &c., &c. A more hospitable people cannot be found on the globe, or one possessing more natural politeness and good cheer. They know of the immense wealth with which nature has blessed their county in timber, water power, iron ores, and coal, and they are anxious to have emigrants from other countries come and aid them in the development of these treasures. The best fishing and hunting in Kentucky is found in Pike and the adjacent counties. In the future, this county will rank far higher than at present in both wealth and population.

POWELL COUNTY.

In 1852 this county was formed from parts of Montgomery, Clark, and Estill, and named in honor of Lazarus W. Powell. It is one of the smallest counties in the State, having less than one hundred square miles of territory. It is bounded on the north by Montgomery and Menifee, east by Wolfe, south by Lee and Estill, and west by Estill and Clark counties.

Geological Formations.—The geological formations of this county are quite varied. In the west end the upper Silurian rocks come to the surface; then, interblended with these, are the Devonian shales, and above these the knobby hills and Waverly sandstones, which, as we go east, pass under thin beds of sub-carboniferous limestones, which in turn are overlaid by the Chester Group, the mill-grit, the conglomerate sandstones, and the true coal measures of the eastern coal field. Nowhere in the State do we find a greater variety of rocks or soils in so short a space of territory as we travel over from the west towards the east. The

general surface of the country is rolling, and in parts hilly and mountainous. There are frequently knobby hills and high bluffs along the rivers, creeks, and ravines. There are fine beds of coal and iron ores in the eastern half of the county, and also numerous salt and mineral springs and wells of excellent water. The Kentucky ridge, a spur of the Cumberland Mountains (which extends from the main summit of the Allegheny or Appalachian chain, in Letcher and Pike counties, north-westwardly across the State, to the mouth of Licking river, opposite Cincinnati), forms the southern boundary of Powell, and is here several hundred feet high. The ridge on the border of this county has been uplifted through all the different strata of the various rocks, from the Silurian to the true coal measures, and now marks the axis of the great commotion that evidently gave shape and character to this portion of the State at an early geological epoch. There is a great deal of good building stone (both of sand rock and lime) in the strata which come to the surface. The soils on the bottoms along the rivers and creeks are exceedingly fertile and rich in plant food. On some of the hills and ridges the land is tolerably good; but where the sandy rocks prevail, the soil is thin and poor.

Agriculture.—On the bottom lands are grown excellent crops of corn, wheat, oats, rye, tobacco, flax, and potatoes. Agriculture, however, has not been so well attended to here as in those counties lying to the west, owing to the difficulty of getting produce to market. The hills and ridges are well suited for orchards and vineyards, and the very best qualities of apples, peaches, pears, quinces, cherries, plums, and other fruits and berries, grow to perfection. So far as grapes have been tried, they have proved a success; and the wine made from the wild grapes, or those of the native cultivated varieties, is exceedingly rich in alcohol and saccharine matter, and has a bouquet equal to the best similar production from the States of Missouri, Illinois, or Ohio. No doubt, with proper care and skill, the industry of wine and brandy-making could be made here quite profitable.

In live stock but little pains have been taken to improve the breeds; consequently, the scrub varieties are everywhere to be found. The native bitter shrubs and mountain grasses indicate a fine range for sheep; and experience has proven that the finer classes of wool-bearing animals do as well here as anywhere on the continent. Large flocks of Cottswold, Merino, and Southdown sheep could here be pastured at a very small expense, which would pay large profits on the investment.

Streams and Forests.—Red river flows centrally from east to west through the county, furnishing valuable water-power for mills, furnaces, or factories. It has numerous tributaries, some of which are good mill streams. The principal of these are Indian, Cane, Hatcher, Morris, Paint, Beech Fork, Black, Brush, Lulbegrud, Middle Fork, South Fork (of Red river), Cow, Cat, Owl, Pick, Mappen, Hatton, and Raccoon creeks. This entire county was originally covered with the heaviest kind of forests, which abounded in every species of oaks, poplar, walnut, ash, hickory, elm, maple, sugar-tree, gum, beech, linden, birch, wahoo, cotton-wood, alder, pine, spruce, arbor vitæ, leather-wood, iron-wood, holly, locust, sycamore, willow, hemlock, &c., &c. Probably 80 per cent. of these forests are still untouched by the woodman's axe. The scenery in these forests and along the precipitous bluffs and mountain ledges is often sublime, and would be well worth a trip of many miles to see. The pea-vines, undergrowth, and mountain grass are still growing in great luxuriance through the vales and on the sides of the mountains.

TOWNS AND VILLAGES.

Like in other mountain counties, the people here have but little use for towns, cities, or villages. They prefer their mountain homes, the good spring water, and the exhilarating air, to thickly crowded streets and the vices of an overgrown population. Therefore, we find *Stanton*, the county seat, which is beautifully located on the south bank of Red river, about the centre of the county, to be the only town of consequence in the county. And even Stanton is not a very large place, having only the court-house and less than one hundred inhabitants; still, it is a thriving town, has a mill, tannery, church, school, and several neat dwelling-houses, and the promise of greater importance in the future, when the mineral and other resources of the country are more fully developed.

West Bend is a neat village, in the northwest corner of the county.

Schools and Churches.—The public common free school system of the State has been inaugurated in this county, and through the zeal of the worthy Commissioner, J. S. Vivion, a school has been taught in each district. The people take more interest than formerly in the education of their children, and their attendance at the schools, though not so good as it should be, is much better than it was in former years. The Hard-shell Baptist, the Missionary Baptist, the Methodist, and Reformed Christians are the principal religious denominations.

The People.—The people of Powell county are industrious, intelligent, kind-hearted, frugal, and hospitable. They do not seek to make large fortunes, nor to rack their brains or nervous systems in the vain hope of finding happiness in the possession of dollars and cents; but, being natural-born philosophers, they take life easy, and are content to follow in the wake of progress made by the more restless of our people. The ladies are patrons of energy, industry, and moral worth, just such as adorned the old republics of the Eastern World when virtue, truth, and honor were the passports to fame and promotion. It is well that our cities are filled with men who are born of such women, instead of from the devotees of fashion and sufferers by self-imposed aches and pains, such as we find parading the streets of all large cities. It is from this stock come our stoutest-bodied and largest-brained men. So mote it be.

PULASKI COUNTY.

This county, named in honor of Count Pulaski, was formed in the year 1798 from parts of Lincoln and Green, and is bounded on the north by Casey, Lincoln, and Rockcastle, east by Rockcastle, Laurel, and Whitley, south by Whitley and Wayne, and west by Wayne, Russell, and Casey counties. A strict measurement would probably show this to have the largest area of any county in the State. It certainly is among the five having the largest territories, viz: Harlan, Pike, Perry, Christian, and Pulaski.

Topography, Soil, and Geology.—This county is quite varied in its geological formations. The northern parts are based upon the sub-carboniferous limestone. The central and western portions are also located upon the cavernous limestone, except where the rivers cut through to the Waverly series of rocks, and occasionally to the Devonian shale; while the east and southeastern and extreme southern neck of the county rest upon the true coal formations. The county lies in the southeastern part of the State, immediately upon the Cumberland river, and along the line of the Cincinnati Southern Railroad, which passes through it for over forty miles. The northern part of the county is rolling, the west and mid-

dle part inclined to be hilly, and the balance almost mountainous. The soil varies in accordance with the rock bases, much of it being very fertile, while other portions are too thin for good cropping. The amount of coal and iron ore in that part of the county based upon the carboniferous rocks is immense, and will prove sources of great wealth when properly developed.

Transportation Facilities.—The Cumberland river is navigable for half the year to within a few miles of Somerset for small steamboats, and flat-boats and rafts can be floated out during the winter and spring months. This transportation, however, is too uncertain for iron furnaces and coal mines; but when the Cincinnati Southern Railway is completed, which will be within a few months, then daily trips for freight and passage to the Northern and Southern cities will stimulate into active operation furnaces and mines, which will bring capital and a new population into the county, and will entirely change the old order of things by making this one of the most productive sections of Kentucky. Rockcastle river, South Fork of Cumberland, Linn, Pittsman, White Oak, and Fishing creeks, all furnish excellent water-power and sites for mills, factories, and furnaces.

TOWNS AND VILLAGES.

Somerset, the county seat, is located about the centre of the county, immediately on the Cincinnati Southern Railroad. It contains about seven hundred and fifty inhabitants; has five or six churches, an academy, a Masonic collegiate institute, a dozen mechanic shops, saw and grist-mills, tannery, bank, many fine stores, and several elegant private dwellings.

Grundy, five miles east of Somerset, contains a population of one hundred and fifty, has several factories and shops, and does a very large local trade.

Mt. Gilead, is about half the size of Grundy, with a corresponding trade.

Waitsboro, on the Cumberland river, is a place of considerable importance as a warehouse and shipping point. *Harrison, Styleville, Charlottsville, Sublimity, Woodstock, Durham, Thompsonville, White Oak Gap, Slickville, Dallas, Dabney, Cedar Knob, Clio, Tatesville, Willow Tree, and Flatrock* are all neat villages, each doing a considerable local business.

Schools and Churches.—The Masonic Institute, located at Somerset, is well patronized by the order in that section; and the Female Academy at the same place is well conducted by an able corps of teachers. The

free common school system of the State has been inaugurated in every district, and gives very general satisfaction to parents, who evince a commendable zeal in having their children improve every opportunity for obtaining a good common education. The Primitive Baptist, Reformer, Free-will Baptist, Methodist, and Presbyterian are the principal religious denominations. The church buildings in the county are substantial and commodious, but not elegant; they, however, answer well the purposes of the people, who regard honest faith and good works more than fashionable sermons or superb buildings. Every neighborhood has a church or two, and all the people have good opportunities for attending service (whenever they feel so inclined) on the Sabbath.

Timber.—Pulaski is one of the best timbered counties in the State, and contains large forests of all kinds of hard and soft wood, such as is best adapted for house building, machinery, agricultural implements, or furniture.

Crops and Fruits.—Corn, wheat, oats, flax, rye, and tobacco are the staple crops. In parts of the county blue-grass grows tolerably well, but herds-grass, timothy, clover, orchard grass, Hungarian, and millet all do well for pastures or hay. Peaches, apples, quinces, pears, cherries, and plums flourish in all parts of the county, and on the hills and free-stone lands seldom fail of a full crop. The uplands and ridges produce excellent grapes, and vineyards of Catawba, Ives Seedling, Hartford, Delaware, or other native varieties, would prove as profitable as any crop that can be cultivated.

Live Stock.—In some parts of Pulaski are to be found good breeds of horses, cattle, hogs, sheep, and poultry. But a majority of farmers hold on to the native kinds, which were brought from Virginia and North Carolina when the country was first settled. Sheep husbandry and hog-breeding could be made very profitable with proper attention and good breeds. Game and fish are plenty, and much sport is had by those who love to follow the dogs or handle the reel.

Domestic Arts.—There are but few manufactories proper, except grist and saw-mills, carding factories, and blacksmith shops. The female portion of the community, however, still continue to spin and weave nearly all the cloth used by their families, with a considerable surplus for traffic to the country merchants. In this way they get dress goods and groceries, and all the fashionable articles needed in making their toilet. They also trade largely to the merchants eggs, butter, poultry, feathers, home-knit socks, beeswax, ginseng, maple sugar, home-made molasses, and various other useful articles made on the farm.

ROBERTSON COUNTY.

This is one of the smallest, if not the least county, in area in the State, and was taken, in 1867, from parts of Nicholas, Harrison, Bracken, and Mason, and named in honor of Judge George Robertson. It is bounded on the north by Bracken and Mason, east by Mason and Fleming, south by Nicholas, and west by Harrison county. It is well watered by the Licking river and its tributaries, the principal of which in this county are North Fork, Shannon, Johnson's Fork, Cedar, Clay, West's, Helen's, Painter, and Fire Lick creeks, and Drift Run. These afford many fine sites for mills and factories.

Geology.—This county is entirely based upon the different strata of the upper Cambrian or lower Silurian rocks, but is quite varied in its soil, which is caused by the change in the outcropping strata. The surface is rolling or hilly, but the lands generally good for cultivation. There are no minerals or coal, unless possibly small deposits of sulphurets of lead, in quantities not sufficient for profitable working. The timber varies with the strata of rocks, consisting principally of oaks, poplar, beech, sugar-tree, wild cherry, walnut, hickory, and ash. Grass, particularly blue-grass, grows well, and corn and tobacco flourish in every part of the county; the smaller cereals, as well as hemp and flax, are well suited for lands in different parts of the county, and, with proper drainage and fertilization of the soils, would grow well everywhere. The rocks are well adapted for making stone fences and for building material, consisting of every variety usually found in the Silurian formations. Mineral water, such as that known as the Lower Blue Lick, is found at several points, and by sinking wells or shafts can be found, no doubt, at the distance of two to four hundred feet, in any of the creek bottoms, which distance will reach the great mineral reservoir, located in the calciferous sandstone of the underlying Cambrian series.

TOWNS AND VILLAGES.

Mt. Olivet, the county seat, located about the centre of the county, has a population of some 300 persons. It contains a good court-house and other public offices, an academy, four or five fine churches, tobacco factories, mills, half a dozen mechanic shops, and several neat private residences.

Kentontown, Pinhook, and Bridgeville are handsome, flourishing villages, each doing the necessary business of its neighborhood.

Agriculture.—Corn, wheat, oats, barley, rye, hemp, flax, and tobacco are the chief products of the farms, and are grown of excellent quality and in large quantities. Blue-grass thrives in all parts of the county, and the hay grasses do well, except on the hills and ridges; consequently, Robertson is, from necessity, a first-class stock county. The best bloods of horses, cattle, sheep, hogs, and poultry are found in every neighborhood, and the familiar "horse and stock talk" prevails here just as it does in Bourbon, Harrison, and Mason. The farmers are devoted to raising tobacco, and take great pains in handling their crops, which are similar to the "Mason County Tobacco," so well known to the trade in this country and Europe. Vegetables and fruits grow here to perfection, and the hills seem well adapted to vineyards; the native vines, particularly the "four stars"—Concord, Ives Seedling, Hartford Prolific, and Delaware—flourish exceedingly well, and give a wine well flavored, of excellent bouquet, and good body.

Schools.—The energetic public school commissioner of this county, Mr. C. N. Bucklin, says: "I have visited all the schools, and find most of them in a flourishing condition. Some districts are in need of good buildings. A good many teachers in attendance at the Institute, who seem to manifest a much greater interest than ever before; so much so that I have concluded to hold another, and assign to each a part in the exercises." Besides the public schools taught under the free system of the State, there are several private schools, and a few good academies.

Churches.—The Presbyterian, Reformer, Methodist, Baptist, Catholic, and Episcopalian are the principal Christian sects. These have many fine churches, with large, attentive congregations. No neighborhood is lacking in having good church and school facilities.

Smaller Industries.—Tobacco, corn, wheat, and stock-raising have so completely occupied the attention of the people of Robertson that they pay but little attention to anything else; consequently, no manufactories of importance are in operation, except tobacco factories and grist and saw-mills. The good, intelligent, economical ladies, however, in some neighborhoods, still hold on to the old-fashioned spinning-wheel and loom, and make cloth for the every-day wear of the family. They also traffic to the country merchants home-knit socks, honey and wax, poultry, eggs, feathers, butter, tree molasses, and home-made sugar. Through means of these lesser industries they add largely to the family income,

and, in the true sense of the term, prove themselves "helpmates" of the husband.

Social Characteristics.—Like the people of all this section, the Robertsonians are refined, educated, and hospitable, fine judges of live stock of all kinds, and delight in contests for premiums on animals of superior excellence and blood. They are also remarkably social and generous in their intercourse with one another, and with strangers who may come among them. The ladies are superior models of their sex, and are usually well-skilled in all the useful and ornamental arts pertaining to the science of housekeeping. But, like their sisters all over the world, they are not indifferent to the effect of beautiful dresses and jaunty hats, and upon all public occasions exhibit the utmost elegance and taste in the arrangement of their toilets.

The price of lands here is about the same as in the adjacent counties of Harrison, Mason, and Fleming, and the supply of labor seems about equal to the demand, and at fair wages, either by the day, week, or month. There is a tendency towards cultivating less land and having it more highly fertilized, which, if followed out by the farmers, will be productive of great benefit to the revenue of the county, and will enable them to sell off the surplus lands to actual settlers, who may come in from other States and become citizens.

ROCKCASTLE COUNTY.

This county, called from Rockcastle river, was formed in 1810 from parts of Lincoln, Madison, Pulaski, and Knox. It is bounded on the north by Garrard and Madison, east by Jackson and Laurel, south by Laurel and Pulaski, and west by Pulaski, Lincoln, and Garrard counties.

Geology, Streams, and Soil.—Rockcastle is quite varied in its geological formation. Beginning at the west border and going eastwardly, we find first knobby hills and Waverly sandstones, then layers of the carboniferous or cavernous limestones, which cover nearly two thirds of the county, and then the true coal measures of the East Kentucky coal

field. The projections of the coal measures over the cavernous limestones and Chester Group are very irregular, owing to the deep-washing of the creeks and rivers, and the disintegration of the sand rocks at some former geological epoch. The heavy mill-grit and conglomerate sand rocks appear in beetling crags along the banks of the creeks and rivers in the eastern part of the county, and, when covered with the mountain laurel, in full bloom, give an exceedingly beautiful, romantic, and picturesque view. The sub-conglomerate coal, so peculiar to this region of Kentucky, outcrops beneath the heavy conglomerate sand rocks at the "narrows" of Rockcastle river. There are quite a variety of iron ores in the eastern part of this county: the limonite, which lies near the cavernous limestone, the carbonate of iron on Meadow creek, pot ores, and carbonate of iron near the black shale beds, and also ferruginous shales and hematitic iron ores. The surface of the country corresponds to the rock formations which underlie. In the western half of the county, except the border knobs, the lands are gently undulating or level, and the soil is quite productive. The eastern part is broken, hilly, and mountainous, but interspersed with many rivers and creeks, upon which are wide bottoms of very rich lands. The ridges being generally of sandstone, are very thin and poor in plant food. The timber forests are extensive and fine, consisting in the western part of oaks, hickory, poplar, walnut, lime-wood, sycamore, black-jack, wild cherry, gum, dogwood, &c., &c., and in the eastern part of all kinds of trees usually found in the mountain regions of Kentucky. The creek bottoms everywhere are well stocked with the sugar-maple, from which a large quantity of sugar is made every year.

The coal mined in this county at Pine Hill and other places, and shipped on the Knoxville Branch of the Louisville and Nashville Railroad, is of very superior quality for grates and factory use. Rockcastle river forms the southeast boundary for over 20 miles, and affords most excellent water-power for mills, furnaces, or factories. Its tributaries are Brush, Skaggs, Roundstone, Renfro's, Copper, Dick's, Eagle, Line, Cockrell's, Dysart's, and Cedar creeks, several of which are fine mill streams.

TOWNS AND RAILROADS.

The Knoxville Branch of the Louisville and Nashville Railroad passes centrally through the county from northwest to southeast, leaving the county at Livingston, on Rockcastle river, to which point it is now completed. The Cincinnati Southern Railroad passes within a few miles of

the western boundary of this county, upon the territory of the adjoining counties of Lincoln and Pulaski.

Mt. Vernon, the seat of justice, is handsomely located about the centre of the county, upon the head-waters of Roundstone creek, and immediately on the Knoxville Branch Railroad. It has a population of about five hundred persons, and contains, beside the usual public buildings, a grist and saw-mill, wool-carding factory, a tannery, three churches, an academy, eight to ten mechanic shops, and many neat, well-appointed private residences.

Pine Hill, five and a half miles from Mt. Vernon, is a thriving town of some eight hundred inhabitants. It has grown up since the completion of the railroad into the county, and is now the location of two large coal mines, four saw-mills, and other factories.

Livingston, the present terminus of the railroad, is pleasantly located on Rockcastle river, at the county line, and, like Pine Hill, is growing rapidly into a coal mining and manufacturing centre. *Mt. Guthrie*, *Broadhead*, *Pleasant Valley*, *Gum Sulphur*, *Goochland*, *Fishpoint*, and *Level Green*, are all neat, thriving villages, each doing the necessary local trade of its neighborhood. Large quantities of coal and lumber are now shipped to Louisville and other places.

Agriculture.—The staple products are corn, wheat, oats, rye, live stock, and tobacco. The land based on the cavernous limestone, as well as the rich river and creek bottoms, is well adapted to the growth of all the staples, as well as for grazing stock upon clover and the hay grasses. Tobacco was but little cultivated until the railroad opened up a market; now it is a leading crop. Orchards and vineyards flourish well upon all the ridges and uplands, and rarely fail to yield good average crops of fruit. Sheep-raising has increased largely within the last few years, and if the worthless curs could be exterminated from the country, would soon become the most profitable branch of farming in this section of the State. Large numbers of mules and hogs are being raised to supply the Southern trade and the Louisville market.

Domestic Arts.—The fashion of manufacturing jeans, linseys, linen, cottonades, blankets, and other cloths, for the use of the family, still remains among the good, industrious women of Rockcastle. The surplus of home-made cloth, after the family is supplied, they traffic to the country merchants for such articles as they may need for family consumption. They also sell to these merchants large amounts of home-knit socks, butter, eggs, poultry, feathers, beeswax, flaxseed, maple sugar, tree molasses, and ginseng root. With these articles they pay a

large proportion of the family expenses, and thereby add to the aggregate finances of the household.

Schools and Churches.—The energetic, wide-awake school commissioner, J. J. Brown, Esq., reports a great improvement in the public free common schools taught under the State system. Teachers of more than usual ability have been employed, and there is a better attendance of children at the schools. The people, too, take more interest in having their children educated than formerly, and evince a commendable pride in having them accept of all the advantages to be derived from the public schools, which are now taught in every district. The Reformer, Baptist, Presbyterian, and Methodist are the principal Christian denominations. The church buildings, "meeting-houses," are usually plain, comfortable log or framed houses, well adapted to the purposes of the worthy, faithful members who worship therein. One or more of these structures is located in every neighborhood, so that no family will have to go more than from five to eight miles to attend church on the Sabbath. The ministers are usually intelligent, pious, eloquent speakers, much beloved by their members. Their salaries, though not large, are generally promptly paid, and sufficient to give a comfortable support.

Characteristics of the People.—The citizens of Rockcastle are intelligent, industrious, thrifty, kind-hearted, and hospitable. They do not rush after fortunes like the people who live in the commercial centres of the nation, but more philosophically take the world easy, and borrow no troubles in advance; yet they are not blind to the advantages of progress, and heartily desire to have people from other States and countries come and settle among them, and give a fresh impulse to the development of the great natural resources of this section of Kentucky.

ROWAN COUNTY.

In 1856 this county was carved out of parts of Morgan and Fleming, and named in honor of Judge John Rowan. It is bounded on the north by Fleming and Lewis, east by Carter and Elliott, south by Morgan, Menifee, and Bath, and west by Bath and Fleming counties.

Geology, Streams, and Soil.—The geological formations of this county are quite varied. The whole of the western and northern parts, including almost the entire valley of Triplett's creek, is occupied by the knob formation and the Waverly series of sandstones, the lower sections usually presenting the black Lingula shale, with a capping of knobby freestone. A very narrow section of the sub-carboniferous limestone appears between the Waverly Group and the mill-grit sandstone of the true coal series. An outcrop of the sub-carboniferous or cavernous mountain limestone, in thin strata, can be seen on Christy's branch of Triplett's creek, at Kirk's horse mill, a few miles southeast from Morehead. Above this mountain limestone the conglomerate and mill-grit stone begin, and thin seams of coal, accompanied by gray shale and silicious iron ores, make their appearance. Near the junction of the freestone and the underlying shale there are some kidney ores, but not in quantities sufficient for mining. The black slate, of great thickness (over 100 feet), in parts of the county, extends nearly up to the freestone formations. Along the banks of Licking river, and elsewhere in the county, are strata of fine-grained knob-stone, suitable for building purposes; and the quarries are so located as to be opened with but little stripping. The ledges are from one to two feet in thickness, and gracefully overhang the banks of the streams. The surface, in some parts undulating, is generally hilly, and in some places mountainous, with beautiful valleys and rich bottoms. The soil is rich in the river and creek bottoms, but elsewhere thin, clayey, and frequently spouty.

Licking river forms the southwest boundary for 20 miles or more, and Triplett's creek flows diagonally through the county from northeast to southwest. These streams are susceptible of improvement by locks and dams. They afford excellent water-power for mills, factories, and furnaces. Their main tributaries (some of which are good mill streams) are Bushy, North, Holly, and Dry Forks, Christy's branch, and Scott's creeks. Fine timber abounds everywhere.

Agriculture.—The staple crops are corn, wheat, rye, oats, and potatoes (Irish and sweet), all of which grow well. Very little tobacco is grown in the county, although the soil is adapted to the production of a fine quality of this weed. The hay grasses flourish here exceedingly well, and, with proper under-drainage, much of the clayey lands could be made first-class for corn, orchard-grass, oats, timothy, herds-grass, and millet. Lime would greatly improve the soil, and gypsum and bone-dust could be used to great advantage where the lands are dry. Horses,

mules, cattle, hogs, and sheep are reared by the farmers and sold to traders from the blue-grass counties, who come here and buy them up for the purpose of refattening. The scrub stock hold the advantage over the finer bloods, because the people think them more hardy, and better able to take care of themselves in "the range." The bitter herbs, the native grasses, and the mountain shrubs peculiarly fit this county for sheep husbandry. Nowhere could the Cottswold, Merino, South-down, and Shropshiredown sheep be kept with more profit or with better success. The succulent grasses, mosses, and shrubs of the hills and ridges could afford them provender in abundance, and the beetling crags and lofty bluffs would shelter them in the winter. Bees here would do well, owing to the spontaneous growth of white clover, and the great abundance of forest trees and plants that produce flowers filled with honey. The people pay very little attention to this industry, because they can find wild honey in the hollow trees of the forest enough for home consumption. Orchards and vineyards do well in any part of this county, and fruit-raising might be made a leading industry if the farmers could once become accustomed to the business. Grapes of the native improved varieties can be produced on the southern and eastern exposures of the hills and ridges equal to those of the hilly counties of Europe, and consequently wine and brandy-making might be carried on at an excellent profit.

TOWNS AND VILLAGES.

Morehead, the seat of justice, is beautifully located on a branch of Christy's creek, about the centre of the county, and immediately on the proposed line of the Lexington and Big Sandy Railroad. Besides the usual public buildings, it has three fine churches, steam saw and flouring mill, shingle machine, an academy, half a dozen mechanic shops, and several neat, well-appointed private residences. The population is now about two hundred and fifty, and promises to be greatly increased when the railroad is completed through the town.

Cross Roads, eight miles from the county seat, is a handsome business town of three hundred and fifty inhabitants.

Pine Springs, nine miles north of Morehead, is quite a flourishing place of over one hundred inhabitants.

Grist Mills, *Cassady's Mills*, and *Farmers* are neat, thriving villages, each doing a good local trade.

Domestic Arts.—Rowan county has never taken a leading place among the manufacturing portions of the State, there being no large amounts

of capital here employed in this class of industry; yet the noble, industrious, intelligent ladies know well how practically to employ the spinning-wheel, the warping-bars, and the hand loom. They manufacture on these articles most of the cloth worn by their families, and a considerable surplus for traffic. In addition to this, they also trade to the country merchants large quantities of butter, eggs, poultry, feathers, beeswax, dried fruits, ginseng root, home-knit socks, flaxseed, maple sugar, and tree molasses. By means of these articles they manage to pay for a majority of the store goods and groceries used at their homes, thus saving large sums for the joint-tenancy of the household, and proving themselves indeed men's helpmates.

Churches.—The Methodist, the Old and New School Baptist, the Reformer, and Presbyterian are the chief religious sects. The church buildings or "meeting-houses" are generally good, commodious structures, well adapted to the purposes for which they were built. The members are usually devoted, pious, earnest Christians, who believe in good works and an honest faith, such as St. Paul speaks of as necessary passports to the haven of safety and happiness. The ministers are pious, well-educated teachers, highly respected by their congregations. Their salaries, though not very large, are promptly paid, and are sufficient for a good livelihood.

Schools.—R. G. Scott, Esq., the energetic, wide-awake school commissioner of this county, has introduced the public free common school system of the State into every district, and now all the children have an opportunity of obtaining a good common education at but little expense, provided their parents and guardians do their duty in sending them to the schools. The people are learning to appreciate more highly the need of having the rising generation well taught, and are aiding the commissioner and the teachers much more zealously than they ever have done in former years. The attendance is now very good.

RUSSELL COUNTY.

In 1825 this county was established out of parts of Adair, Cumberland, and Wayne, and named in honor of Colonel William Russell. It is bounded on the north by Adair and Casey, east by Casey, Pulaski, and Wayne, south by Wayne and Clinton, and west by Cumberland and Adair counties.

Geology, Streams, and Soil.—There is quite a varied geological system of rocks exhibited in this county. Beginning at the base rocks of Cumberland river, with the blue limestone of the Silurian, it passes, by means of the washing of the river and creeks, through the upper Silurian, the Devonian shale, and the knobby hillstones, into the Waverly sandstones, which form the surface-rocks of three fourths of the county. Above the Waverly sandstones is a belt of country around Jamestown, and also south of the Cumberland river, which is based upon the cavernous sub-carboniferous limestones. The Cumberland has cut down through steep banks into the Silurian rocks, and has made wide bottoms of exceedingly fertile lands. The general surface of the country is hilly and broken, and on the sandstone basis the soil is thin, and not well adapted to the growth of large crops of cereals, but, nevertheless, grows a very fine article of tobacco. The limestone lands are more level, and frequently abound in caves and sink-holes; and the soil here is also much better adapted to farming purposes. These better lands lie adjacent to Jamestown, and between that place and Pulaski county. Timber is abundant in Russell, and consists of all the varieties indigenous to that latitude.

Cumberland river flows in a southwestwardly direction entirely through the southern part of the county, and affords a sufficiency of water for steamboat navigation six months in the year. Its tributaries are Indian, Otter, Beaver, and Harman's creeks, on the south side, and Wolf, Caney, Roaring Lily, Greasy, Blackfish, Butler, and Miller's creeks, on the north side. Sulphur Fork, Cabin, and Reynolds' creeks, in the northwest end of the county, flow into Russell creek, and thence into Green river. Several of these streams afford excellent water-power for mills and factories. It is highly probable that coal oil will be found in Russell.

Agricultural.—Russell county, while not exceedingly rich, yet produces good corn, wheat, oats, tobacco, hay grasses, and potatoes. On the bottom lands large crops of corn, hay, oats, and tobacco have been grown, equaling those of the best blue-grass soils. Fruit of all kinds, including grapes, do well in every part of this county, and no doubt orchards and vineyards for cider, wine, and brandy-making can be made as profitable here as in any part of the Western country. Before the internal revenue tax was placed upon distilled spirits, the peach and apple brandy of Russell county had a reputation from Jamestown to New Orleans. Since the war, but little of this superior brandy has been made, owing to the uncertainty of satisfying the demands of government officials. In live stock of all kinds, Russell is about like the neighboring counties. Scrub breeds are altogether in the ascendency, and but little pains have been taken to improve the quality of horses, mules, or cattle. The old razor-back wattled hogs roam over the range, and make their living upon acorns, angelica, and sweet-brier roots. Their noses and faces have been elongated by the laws of adaptation and progressive development for this purpose. The scrub cattle and sheep also scour “the range” for food, having little care taken of them, except at shearing time, or when fresh beef or mutton is wanted. The grasses, shrubs, and climate are peculiarly adapted to sheep husbandry, and if the long-wooled Shropshiredowns or Cottswolds were introduced, no doubt they would so improve the native stock as to make wool-growing the most profitable branch of agriculture that could be followed in this part of Kentucky. Bees flourish exceedingly, owing to the many varieties of trees and plants that bear flowers suitable for their use.

TOWNS AND VILLAGES.

Jamestown, the seat of justice, is handsomely located on a beautiful plateau near the centre of the county. It has a population of two hundred, and, beside the usual public buildings, contains two churches, two hotels, a grist and saw-mill, an academy, half a dozen mechanic shops, and several neat private residences. *Creelsboro*, *Lairsville*, *Rowena*, *Millersville*, *Montpelier*, *Royalton*, *Buena Vista*, and *Horse Shoe Bottom*, are small thrifty villages, each doing the necessary mercantile business of its neighborhood.

Schools and Churches.—Besides the Academy or High School at Jamestown, the common free schools on the State system are taught in nearly all the districts of the county. The attendance of the children is not so

good as it ought to be, but is improving each year; and the people are taking more interest than formerly in having their children properly instructed. The Methodist, the Hard-shell Baptist, the Reformer, the Missionary Baptist, and the Presbyterian are the chief religious sects in the county. The "meeting-houses" are good, plain, log or frame structures, not very fine or showy, but well-suited for the uses intended. These buildings are scattered through the country, so that one or more is located in each neighborhood; and here the good, zealous Christians meet every Sabbath to worship and to listen to the eloquent teachings of their popular ministers, little caring for the fine equipage of gaudy chapels or showy steeples, provided they feel assured of honest hearts, a pure, unchanging faith, and good works, such as St. Paul tells of, as necessary passports to safety and unceasing happiness. The congregations are generally large and attentive listeners.

Smaller Industries.—Russell has never taken the lead in manufacturing industries. A few saw and grist-mills, tanneries, and mechanic shops are her main exhibits in this line; but the good, industrious, intelligent, economical women of the county, who are, indeed, "the salt of the earth" here as elsewhere, still retain and use the old-fashioned hand-loom, warping-bars, and spinning-wheels in the manufacture of jeans, linseys, counterpanes, blankets, linen, and such other cloths as are needed for family wear. Any surplus is traded to the country merchants, with whom, also, the matrons deal largely in butter, eggs, poultry, feathers, flaxseed, beeswax, maple sugar, ginseng, and tree molasses. In this way they get all kinds of fancy articles and dress goods, "spun truck," and groceries, thereby saving largely to the joint-tenancy household department.

Social Features.—It is in the every-day routine of life where we can best judge a man or woman, and so of communities. The social features of a people show their real status. Viewed in this way, the good, intelligent citizens of Russell make a fine exhibit. In their every-day life they do not rush and press themselves to death in pursuit of riches, but act more philosophically, and take life easy. It is seldom that a Russellite ever destroys his nervous or mental system by fretting over work, or in search for the almighty dollar. These people love to have their amusements as they plod through life, and, being of social temperaments, they always aid each other at log-rollings, quiltings, house-raising, wedding parties, or when harvesting the crops; and on all such occasions they have feasts and dances, where everybody helps to make

everybody else happy, cheerful, and contented. At these meetings there is no formality or prudish selfishness; but first the work is allotted and done, and all hands then set to work to have a good time generally; and they never fail to enjoy themselves, just as all of our forefathers and mothers use to do in the good old times, before large cities were built and railroads and telegraphs started the world at a break-neck speed in search of riches. These fashions are still kept up in Russell and in many of the interior counties of the State; and we trust it may be many years before the people think themselves too rich to discontinue them. Emigrants would find in Russell cheap lands and good, hospitable neighbors, who would give them a hearty welcome.

SCOTT COUNTY.

This county, named in honor of Gov. Charles Scott, and taken from a part of Woodford in 1792, is bounded on the north by Owen and Harrison, east by Harrison, Bourbon, and Fayette, south by Fayette and Woodford, and west by Franklin and Owen.

Rocks and Soil.—Scott county is based altogether on the upper Cambrian or lower Silurian rocks, and is in the centre of the Blue Grass Region of Kentucky. The south and east parts of the county next to Bourbon, Fayette, and Woodford counties is a beautiful rolling or level land, made from the calcareous marly blue limestones, rich in fossil shells. This section is of unsurpassed fertility. To the north and northwest the surface of the country becomes more hilly, and is more varied in the character of the top soil, being very rich where the best strata of blue limestones outcrop, but less productive when underlaid by strata of a less marly and fossiliferous character. The soil, being derived exclusively from the rocks, marls, and vegetable mould that have accumulated through numberless ages, always indicates its own fertility by the growth of the native timber trees, the walnut and blue ash prevailing more extensively as the lands improve in fertility.

Streams and Water-power.—Eagle creek, North and South Elkhorn, and their tributaries, give this county excellent drainage, and afford

good water-fall and many fine sites for mills and factories. These are also streams particularly noted for furnishing the best fishing grounds in Central Kentucky of their size.

Agriculture.—Hemp and blue-grass grow here to perfection, and corn, wheat, barley, oats, flax, rye, potatoes, and tobacco are staples that never fail of a good average crop. Fruit, too, does well, and apples, cherries, plums, peaches, quinces, pears, berries, nuts, and melons flourish as well as in any place of a similar geological formation. Grapes succeed finely, and vineyards of native vines, well attended to, can be made profitable, both for the berries and wine-making. First-class hay is easily raised from clover, herds-grass, orchard grass, timothy, Hungarian, or millet. An application of chemical fertilizers to these lands when tired, would greatly improve the yield of wheat, tobacco, corn, and barley.

TOWNS AND VILLAGES.

Georgetown, the county seat, is beautifully located in the southern part of the county, on the south side of North Elkhorn, where a very large, bold-running spring bursts out from the adjacent hill, with water sufficient to run a good-sized mill. The court-house and public offices are good, substantial brick buildings. There are some eight or ten fine churches, a Baptist college, under the control of able professors, woolen, carding, and hemp factories, grist and saw-mill, a dozen mechanic shops, and numerous elegant private residences. The population is about one thousand eight hundred persons. The Cincinnati Southern Railroad passes through the town, and gives daily traveling and freight facilities to the north and south.

Great Crossings, Stamping Ground, Oxford, Newtown, Stonewall, White Sulphur, Payne's Depot, Straight Fork, Little Eagle, Minorsville, and Dry Run, are all neat, thriving villages, each having good schools, mills or factories, fine churches, and stores and groceries and mechanic shops sufficient for the use of their respective neighborhoods.

Live Stock.—Scott is one of the best "blue-grass and stock counties" in the State. It is centrally located on the blue limestone formation, and yields among the largest averages of corn, rye, barley, and hay grasses, as well as the finest quality of blue-grass pastures. Here are to be found the best known pedigrees of horses, cattle, hogs, sheep, and poultry, and every farmer strives to have on his farm the best bloods. The scrub stock has long since disappeared, and now for a farmer to be caught with common stock on his premises, would subject him to the

universal criticism of his neighbors. Fast racers and trotters are everywhere to be met with, and for a "trotter" to go over three minutes in making a mile on trial of speed would not be tolerated. The racing stock ranks equal to any in America, while the Short-horns, among cattle, and Poland China and Berkshire hogs, equal those of the best counties in England.

Schools.—At Georgetown is a male college and two large, well-conducted female seminaries. At other places are good private schools, beside the free public schools taught in every district under the State common school system. The people are thoroughly alive to the necessity of having their children well educated, and take a commendable interest in the free schools as well as in the private institutions of the county. Many persons send their children off to other academies and colleges, either in Kentucky or some of the sister States, in order to have them educated after some particular manner, or to give them superior advantages not to be met with at home.

Religious Denominations.—The Baptist, Reformer, Methodist, Catholic, Presbyterian, and Episcopalian are the principal religious sects of Christians. Each of these have fine church buildings, and good congregations in the county, no neighborhood being without one or more good houses, which are owned, either singly or jointly, by one or more denominations. The number of members compare favorably with that of any other county in the State in proportion to population.

Domestic Arts and Customs.—Very little cloth is now made by the old process of spinning and weaving at home on the old fashioned wheel and hand-loom. The people think it pays them better to raise stock, grain, hemp, and tobacco (and when convenient to the depots or towns), poultry, fruits, and vegetables. The high price of lands, the deep rich soil, the excellent blue-grass, and the fine breeds of stock, have all combined to make the people of Scott independent of want, and have caused almost every family to "live on the fat of the land." This, together with their general intelligence, high-toned integrity, and native hospitality, makes Scott county one of the most desirable residence counties in Kentucky or the West, and always will stamp her as a "garden spot" among the many rich sections of the Ohio Valley.

SHELBY COUNTY.

In 1792, at the first session of the Legislature after Kentucky had been admitted a State into the Union, this county was cut off from a part of Jefferson, and named in honor of the acting Governor, Isaac Shelby. It at first contained the greater part of the territory now included in Spencer, Franklin, Henry, Oldham, and Gallatin counties. It is now bounded on the north by Oldham and Henry, east by Franklin and Anderson, south by Anderson and Spencer, and west by Spencer, Jefferson, and Oldham counties.

Streams, Soil, and Geology.—This entire county is based upon the blue limestones of the upper Cambrian or lower Silurian date, except a small area next to the Jefferson county line, which belongs to the upper Silurian. There are no coal or valuable ores in Shelby, unless there may be found small veins of lead and sulphuret of barytes, in connection with the "bird eye" strata of the blue limestone. The general surface of the country is gently undulating, and the soil is remarkably rich in potash, sulphuric and phosphoric acids, and lime. The subsoil is red, while the top soil is of a dark or black color, and is very loose, friable, and exceedingly fertile. The native growth of timber is walnut, ash, hickory, elm, sugar-tree, beech, &c. The streams are Brashear, Beech, Clear, Bullskin, Gist, Floyd's Fork, East Fork, North Fork, Middle Fork, Fox Run, and Plum creek, flowing into Salt river, and Benson, Six-mile creek, Collett's creek, Jackson's creek, and Indian river, flowing into the Kentucky. The lands between Bullskin and the line of Jefferson county, though good, are not so fertile as those around Shelbyville, and the growth of timber consists more of oak, beech, and poplar.

TOWNS AND VILLAGES.

Shelbyville, the seat of justice, is handsomely located upon Clear creek, near the centre of the county. It contains a population of about 2,500 persons, and, beside the usual public buildings, has more than a dozen fine churches, one college, three academies, a graded common school, a dozen different manufacturing establishments, about 35 to 40 mechanic shops, and numerous elegant private residences. It is at present the terminus of the Shelbyville Branch Railroad.

Christiansburg, 10 miles east of Shelbyville, on the line of the Louisville and Lexington Railroad, is a beautiful town of about 300 inhabi-

tants. It has a woolen factory, grist and saw-mill, a fine school, and half a dozen mechanic shops.

Simpsonville, 8 miles west of the county seat, on the Louisville and Shelbyville Turnpike, has a fine school, grist and saw-mill, half a dozen mechanic shops, and many handsome residences.

Hardinsville, on the east side of the county, is a neat, thriving town of one hundred inhabitants.

Clay or *Clayvillage*, six miles from the county seat, on the Frankfort pike, is a beautiful place in a rich section of country. It has a population of one hundred, and contains several fine residences.

Bagdad, *Jacksonville*, *Harrisonville*, *Fields*, *Scott Station*, *Finchville*, *Longrun*, *Todd's Point*, *Chestnut Grove*, *Southville*, *Graeffenburg*, *Paytona*, *Consolation*, *North Benson*, and *Hansboro* are small villages, each doing the local trade of its neighborhood. Turnpikes abound in Shelby, and almost every neighborhood road is well macadamized.

Schools.—This is one of the best provided counties with schools in the State. The whole atmosphere around Shelbyville is scholastic and literary. It is the centre of the school system of this section, and noted throughout the West for the literary tastes and accomplished scholarship of its inhabitants. *Shelby Female College*, located at Shelbyville, is under the able management of Prof. W. H. Stuart, assisted by several well-educated and accomplished tutors. *Science Hill*, at Shelbyville, is the name of one of the oldest institutions in Kentucky, if not the oldest of its kind in the West. It was originated by the accomplished teacher, Mrs. Julia A. Tevis, who remained the active head of the institution for over a half a century. This ably-conducted seminary is one of the most prosperous and extensively patronized female academies in the Western States. *Shelby Academy*, also at Shelbyville, is a well-arranged high school, under the control of Prof. T. J. Doolan and an able corps of assistants. The graded free common school of the city of Shelbyville, taught under the State system, is one of the best regulated institutions of the kind in Kentucky. The principal is Prof. R. W. McRery, who is aided by four competent assistant teachers. There are several other high schools and private academies in the county, besides the State common free schools, which are taught in every district.

Churches.—The Shelbyites are a church-going people. No neighborhood is without one or more finely-appointed church buildings, well located on some turnpike road in some village or town, so as to be convenient to all the people who assemble at the "meeting house" every Sabbath. The principal Christian denominations are the Presbyterian,

Baptist, Reformer, Methodist, Catholic, Episcopalian, Unitarian, and Universalist. The church members are generally intelligent, pious, devout, practical working Christians, who believe that good works and a steadfast faith are each requisite in order to fulfill the demands, and to insure passports to a future life of happiness in the blessed abode spoken of by the prophets. The ministers are usually well informed, skillful debaters, and eloquent speakers, who are held in high esteem for their devoted piety and upright lives. Their salaries, though not very large, are promptly paid, and generally sufficient for a handsome support.

Agriculture.—The excellent climate and rich lands of Shelby have made her a leading agricultural county in Kentucky for the last seventy-five years. Hemp, corn, wheat, rye, oats, barley, tobacco, potatoes, blue-grass, clover, and hay are the staple crops. The lands appear equally well adapted to each of these, and the farmers rarely ever fail of making a good yield, no matter what they plant. This is owing to the large amount of sulphuric and phosphoric acid contained in the soils, and the calcareous marly lime rocks which underlie the surface of the country in thin strata, that are all the while supplying plant food by the disintegration of their scaly particles. This great productiveness of cereals and grasses, also, naturally places Shelby in the front rank of the live stock counties of the State. Here are found the choicest breeds of horses, cattle, sheep, hogs, and poultry known on the continent. Swift racers and trotters are met with in every neighborhood. The best beef and milk cattle, of the Devonshire, Short-horn, Durham, Alderney, Ayrshire, and other breeds famous in the American or English Herd Book, are common through the country. Cottswold sheep are reared here that weigh over 400 pounds, and that shear over 30 pounds to the fleece. The Poland-China, Essex, red and black Berkshire, and Chester-White hogs, grow to astonishing weights. The poultry, too, partakes of the general excellence, and is noted for its capacity for producing eggs and taking on flesh at an early age. All kind of fruits, including grapes, grow freely, and rarely fail to make good average crops. Apples, pears, peaches, apricots, nectarines, plums, quinces, cherries, and all sorts of small fruits and berries, are extensively cultivated, and afford sources of profit. It is no wonder that the Shelbyites are proud of their county, and call it a garden spot. "Horse-talk" and "sheep-talk" are as fashionable as in Fayette.

Smaller Industries.—The proximity of Louisville, and the importance of its rapidly-growing market, forces the people of this county to

change from the old style of soil-tillage upon the plantations to that of garden-farming. Accordingly, we find the large land-owners are subdividing their tracts, and selling to parties who are rapidly extending the vineyards, orchards, and market-gardens. The dairying business is also coming into general popularity, and every railroad station has become a depot for the dairyman's use. Of course these more profitable industries shut off the old plan of making cloth by means of the spinning-wheel and hand-loom, that was once the habit in this county. The people now work to supply the hucksters, who buy from them at their own homes, or at the nearest depot, all the poultry, eggs, butter, cheese, milk, feathers, pigs, calves, and lambs that can be produced upon the farms. This class of farming pays best, and by it the people are becoming very rich and prosperous, and the country is being adorned with fine houses, beautiful lawns, elegant vegetable and flower gardens, and the finest of stock farms.

Social Characteristics.—Fine feathers make fine birds; so prosperity makes the people of this county noted for their refinement, intelligence, high-toned honor, manly bearing, and genial hospitality. The characteristics of the Virginia and North Carolina gentry, intermixed with those of some of the best English, Scotch, Irish, and German families, who were the joint progenitors of the Shelby county people, here outcrop and show the peculiar traits which distinguish the Kentucky and Southern population of our country. The impress of the independent master of his own household and labor, which comes from the past system of African slavery, is still visible in the enlarged views and generous impulses to be met with in every grade of society. The women are models of intelligence, modesty, virtue, sympathy, beauty, and all the excellencies that render our Kentucky ladies so noted throughout the world. As housekeepers and helpmates, they have no superiors; and in no country can be found women who can better adorn a parlor or govern a nursery. Indeed, Shelby is a noble, grand old county, and just such a place as would undoubtedly suit emigrants from other States or countries who are in search of rich garden-farms, good society, and happy homes.

SIMPSON COUNTY.

In 1819 this county was cut off from parts of Allen, Warren, and Logan, and named in honor of Capt. John Simpson. It is bounded on the north by Logan and Warren, on the east by Warren, south by the Tennessee State line, which separates it from Robertson and Sumner counties in that State, and west by Logan county.

Geology, Streams, and Soil.—The cavernous sub-carboniferous limestone formation prevails over all this county, except a strip of country lying along the Tennessee State line, which is of the Waverly sandstone era, and is identical with the rocks which form the rim of the Central Tennessee basin. There are in Simpson no mineral or coal lands. The general surface of the country is level or gently undulating. The soil is quite rich over more than two thirds of the county, being of that class of lands known as cavernous limestone barrens or prairies, similar to those in Christian, Todd, Logan, and Warren. The south side of the county has a free, thin soil, which produces a fine article of tobacco, good fruit, and fair yields of all the cereals. The subsoil of the limestone lands is of a deep red or yellowish-red color, and contains all the elements of plant food required by the staple crops of the country. Deep plowing, subsoiling, green manures, and hard freezes are, therefore, of great advantage to the lands of this section. Drake creek, which empties into Big Barren river, runs a little to the east and northeast of this county, and its tributaries, Sulphur, Middle, Lick, and Sinking creeks and West Fork, drains nearly the entire county; the extreme west and southwest parts are drained by Big Spring creek and tributaries of Red river.

Agriculture.—The principal staples of this county are corn, wheat, oats, rye, clover, barley, hay grasses, and tobacco. Some cotton is grown along the Tennessee border, but principally for home use, except when high prices induce the farmers to make it a leading crop. The soils formed by the rotting or disintegration of the cavernous limestones, and the rocks which overlaid them at an early geological epoch, though not so rich as those formed by the blue limestones of the Silurian period (being inferior to these for blue-grass and hemp), are probably the best for general farming purposes of any in the State. They are superior to the blue-grass lands for wheat, oats, clover, tobacco, cotton, and some

of the hay grasses, and nearly their equal for corn. These are the lands which give character to Christian, Todd, Caldwell, Logan, Simpson, Warren, Barren, and Allen counties. Resting on a subsoil of red ferruginous clay, filled with calcareous marly lime, and impalpable silicious matter, the top soil of this formation is continually receiving accretions from deep plowing, subsoiling, hard freezes, and the capillary attraction which brings the elements of plant food to the surface so that they may be dissolved by the carbonic acid of the rain water, and then assume a form suitable for assimilation as plant food. This, too, renders the lands capable of retaining all the manures placed upon them. Being generally level, these soils, with such a basis, can always be kept in the very best possible heart by the addition of such chemical fertilizers, from time to time, as may be consumed by and exported with the crops. Wherefore, here, above all other countries, the farmer should understand how to scientifically use fertilizers, in order to make his lands from year to year yield the best and most lucrative crops. With lands not so good as those of the Kentucky barrens, the Chinese and Japanese, who are the most skillful farmers on the globe, have produced large consecutive crops for over 3,000 years by the use of fertilizers, keeping the soil in heart the whole time, and having the country now richer in plant food than it was in the beginning. In live stock, Simpson is an average county. Good corn and good hay make good stock, even when scrub breeds are used—so the Simpsonites find; but if they could once lay aside their exceeding great love for scrub stock of all kinds, and breed from only the best bloods of horses, jacks, cattle, sheep, and swine, they could soon have pedigrees that would compare favorably with those of the Blue Grass Region. Hogs, sheep, and mules do particularly well in this part of the State, and can be reared as cheaply as in any part of America. Large numbers of mules and hogs are sent to the Southern States markets every year. Fruits of all kinds do well, and grapes, so far as they have been tried, prove a success. Previous to the war, when men were free, and labor untrammelled, the apple, cider, peaches, and brandy of this county were noted throughout South Kentucky and North Tennessee; but, alas! the revenue collector is seen in the land, and the good old apple and peach brandies of Simpson have vanished as the mists of the morning! Times may yet change, and the national debt may cease to burden the necks of the people; if so, "peach and honey" will once more give joy to this people. Bees do exceedingly well here, on account of the indigenous growth of white

clover, and numerous other plants affording flowers upon which they feed.

TOWNS AND VILLAGES.

Franklin, the seat of justice, is pleasantly located upon a plateau at the head of Big Spring creek, on the Louisville and Nashville Railroad. It contains a population of nearly two thousand five hundred industrious, energetic people. It has, beside the usual public buildings, eight churches, two large flouring mills, one wool-carding factory, saw and grist-mill, a male academy, a female seminary, a bank, agricultural works, over thirty mechanic shops, and numerous handsome, well-appointed private residences.

Middleton, nine miles west of the county seat, on the road leading to Russellville, is a beautiful village of about one hundred inhabitants.

Palmyra, eight miles east of Franklin, has a population of about sixty.

Hickory Flat is a neat village, containing about fifty inhabitants.

Smaller Industries.—Although the people of Simpson are in independent circumstances, still the industrious, intelligent women use the spinning-wheels and hand-loom. They manufacture large amounts of cloth for home use and traffic, and also sell to the country merchants eggs, butter, poultry, feathers, flaxseed, dried fruit, and home-knit socks. The men are very little engaged in any business other than that of merchandising in the towns or farming in the country; yet there are grist and saw-mills and mechanic shops at Franklin, and scattered through the county, sufficient to supply the needs of the agricultural population.

Schools and Churches.—The "Female College" at Franklin is a well-organized institution, under the able management of Prof. M. D. Bourne and a faculty of tutors. The male academy at the same place is well-conducted and largely patronized. The energetic, intelligent county commissioner, G. W. Roark, has succeeded in inaugurating the free public common school system in every district, and has so popularized it that now the schools are taught by competent instructors in every neighborhood. The principal Christian denominations are the Catholic, the Presbyterian (Old School and Cumberland), Hard-shell and Missionary Baptist, Reformer, Methodist, and Episcopalian. The church buildings are usually large, comfortable structures, well-suited to the wants of the congregations that meet in them on the Sabbath for worship, and to listen to sermons from able divines.

The People.—Simpson county has a population noted for its industry, thrift, intelligence, and hospitality. The people are a law-abiding community, who keep themselves well-posted in all the points of progress making by the rest of the world, and are ever ready to accept of all improvements which experience shows to be desirable. The females are superior housekeepers, and are noted for their healthfulness, beauty, grace, and elegance of manners. Society is first-class, and nowhere is there a higher tone of moral rectitude and justice.

SPENCER COUNTY.

This county, named for Captain Spear Spencer, was formed in 1824 out of parts of Bullitt, Nelson, and Shelby. It is bounded on the north by Shelby, east by Shelby and Anderson, south by Nelson, and west by Bullitt and Jefferson counties.

Streams, Geology, and Soil.—Spencer county is based entirely upon rocks of the lower and upper Silurian era. The surface of the country is undulating or hilly, and the soil rich and very productive. Some neighborhoods have more fertile lands than others, dependent upon the stratum of blue limestone which may come to the surface. The southwest part of the county, adjoining Bullitt and Nelson, is based upon the upper Silurian rocks, which are not so fossiliferous as those of the balance of the county; and, therefore, this part of the country is not altogether so good for hemp or corn, yet it produces good grass and all the cereals and tobacco well. No coal or minerals are in Spencer county, unless slight traces of lead and the sulphuret of barytes may appear with the "birds-eye" strata of the lower Silurian rocks. The lands in this county are all rich where the rocks do not come too close to the surface, so as not to give a supply of soil. The growth of native trees consists of walnut, ash, poplar, beech, hickory, sugar-tree, maple, locust, hackberry, &c., &c., with undergrowth of papaw, vines, and cane.

Salt river enters about the centre of the eastern border of the county, and passes from east to west through it. Its tributaries are Ash, Big Beech, Little Beech, Brashear, Elk, Plum, Simpson, Jack's, and Gist

creeks, and South Fork. These streams afford a fine drainage and excellent water-power for mills and factories. The timber of this county was originally very fine.

Agriculture.—Soil tillage is the leading industry of Spencer. The chief staples are hemp, tobacco, corn, wheat, rye, barley, oats, blue-grass, hay, and potatoes. All of these grow to perfection; and in no part of the State are better average crops of these articles made than here. The fine grass and corn naturally makes this a first-class stock region. Accordingly, we find the best breeds of horses, cattle, hogs, sheep, and poultry. What is most needed is a narrow-gauge railroad to Louisville to develop this section into one of the best spots for garden-farming in the entire Western States. Having the same geological basis as Shelby county, with the same rich rocks from which to draw, and the same supply of phosphoric and sulphuric acid, calcareous marly clay, and friable top soil, Spencer lacks nothing but railroad facilities to make garden-farming just as profitable here as it is about Shelbyville. Fruits of all kinds do well, and apples, peaches, pears, quinces, plums, damsons, cherries, and all the smaller fruits and berries, rarely fail of producing full crops every year. Vineyards, so far as they have been tried, are a success, and the native improved vines or good seedlings can be depended upon, if properly attended to, for a good average yield almost every season. Wine and brandy-making can, no doubt, be successfully followed in this county, and made as profitable as any other industry. (See Wine-making, Washington county.)

Domestic Arts.—The proximity of the city of Louisville has caused the people to look to profits from the sale of lambs, pigs, calves, dried fruit, beeswax, butter, and poultry more than to domestic manufactures. We accordingly find but few families who now make cloth, as was formerly the custom, upon the old-fashioned hand-looms. A narrow-gauge railroad from Taylorsville to Louisville would soon convert the large planters into garden farmers, and cause a subdivision of the larger farms, and materially change the plan of soil-tillage. As it is, much of the profits accruing from the dairy and poultry yard are lost for want of a convenient market. Cheese-making could be carried on in this county as profitably as in the western part of New York, or the reserve counties of Ohio.

TOWNS AND VILLAGES.

Taylorsville, the county seat, is handsomely located about the centre of the county on the north side of Salt river, near the mouth of Brash-ear's creek. It contains a population of about seven hundred persons;

has six fine churches, two seminaries or academies, grist and saw-mill, tannery, a dozen mechanic shops, and several elegant private residences.

Mt Eden, twelve miles northeast from Taylorsville, is a beautiful, flourishing town of two hundred inhabitants.

Elk Creek, *Little Mount*, *Smileyville*, *Waterford*, and *Wilsonville* are small places, but very neat, thriving villages, each doing a considerable local trade.

Schools and Churches.—The female seminary and male academy at Taylorsville are each well-organized institutions, under the charge of able professors and tutors. The free common State schools are taught in every district, and the parents are taking a great interest in their success. The attendance of the children, though not so good as could be desired, yet is far better than it formerly was, and is improving each year. The school-houses are generally well-arranged, and very centrally located. The grade of instructors is much higher than in many other counties, and the mode of instruction is quite satisfactory. The Presbyterian, Catholic, Baptist, Methodist, Reformer, and Episcopalian are the principal Christian denominations. The church buildings or meeting-houses, outside of Taylorsville (where they are quite fine), are usually neat, well-constructed frame buildings, handsomely painted. These are scattered over the county, so that one or more can be seen in every neighborhood. The members are intelligent, devoted communicants, who believe in good works and a steadfast faith as passports to the haven of future rest and safety. The ministers are generally well-educated, eloquent speakers, who command the respect of their congregations by their piety and exemplary conduct. Their salaries are usually sufficient to procure a comfortable living, and are promptly paid.

Social Characteristics.—Where any people have grown independent of want, and are surrounded by plenty, we may naturally expect to find good society. This is the case in Spencer. Here there are no really poor people. The jails are empty, the court dockets are scant of cases, and what few lawyers are located in the county talk seriously of emigrating to better pastures. There is a poor house, but few know where it is located. The old social habits indigenous to the pioneers are still, to a great extent, preserved, and the people have never learned how to be otherwise than honest, industrious, thrifty, well-informed, and hospitable. The women, like their sisters of the adjoining counties, are intellectual, healthy, refined, and noted for their excellence, virtue, beauty, high morals, and just appreciation of the good and beautiful. "Equal

to a Spencer county wife," when spoken by one of the old settlers, carried with it a compliment of which any man's helpmate might justly be proud. In the near future, when traveling facilities are improved, this county will take a front rank among her sisters, and emigrants will flock to her rich lands.

TAYLOR COUNTY.

This county was noted as the 100th in the order of its formation, which took place in 1848. It was named for General Zachary Taylor, and was taken from a part of Green. It is bounded on the north by Larue and Marion, east by Casey, southeast and south by Adair, and southwest and west by Green county.

Geology and Soil.—Taylor county lies between Muldraugh's Ridge on the north and Green river on the south. Muldraugh's Hill or Ridge is a series of "knobby hills," based upon the Devonian shales, and terminating at their tops or surface with the Waverly sandstones, and sometimes with thin strata of the overlying sub-carboniferous limestones intermixed. In going south from Marion county, it is necessary to ascend the escarpment of hills or ridge, which is the dividing line with Taylor. This brings before us an undulating and partially hilly country, based almost entirely upon sandstone of the Waverly Group, or upon the sub-carboniferous limestones. This formation (Waverly) and the sub-carboniferous limestone underlie nearly the entire county of Taylor; occasional outcrops of Devonian are found in the ravines or creeks, and the cavernous limestone occupies the high ridges. There is no coal in these formations, and but little iron, though some ores occur on Brush creek, near the Green county line. Much of the soil is thin, in some places clayey and white, but in other parts it is rich and quite fertile. The same knobby formation which lies on the north limit extends also along its northeastern and eastern border. The timber of the county is excellent, consisting of the different oaks, hickory, poplar, beech, elm, maple, &c., &c.

Agriculture.—Though not one of the richest counties, yet the lands of Taylor produce in abundance wheat, corn, tobacco, oats, rye, potatoes, and the hay grasses. Chemical fertilizers, particularly gypsum and superphosphates, would add greatly to the productive capacity of the soil. The tobacco grown in the southwestern part of the county has a very fine texture, quite similar to that grown on Bacon creek, in Hart county. This is one of the best adapted counties in the State, both by its altitude and soil, to orchards, small fruits, and vineyards. Peach, apple, and grape brandy could be made here to great profit, and wine and cider without limit. As a grazing country, this is only fair, except that clover and the hay grasses grow finely, and adapt the country especially to mule-breeding and sheep-raising. Good breeds of Cotteswold and Merino sheep would pay here better than any other class of live stock, and next to these mules and hogs. The scrub stock generally hold complete sway in this section of the State, although some of the more enterprising farmers are beginning to introduce better pedigrees. Bees flourish well, owing to the indigenous growth of white clover and other plants and trees which bear honey-producing flowers.

Streams and Railroads.—Green river, which is navigable to Munfordville, in Hart county, forms the southern boundary of this county. This stream could be made navigable beyond the Taylor line by locks and dams. Its tributaries, which drain the county, are Robinson, Wilson, Stoner, Blockhouse, Buckhorn, Black Lick, Long Branch, Meadow, Big Brush, Little Brush, South, Middle, and North Pitman creeks. The Louisville and Nashville Railroad runs about 25 miles to the west, and the Knoxville Branch Railroad 10 miles to the north of this county. The Ohio and Cumberland Railroad has been surveyed centrally from north to south through the county, and some grading done. When this road is completed (?) the county will have excellent facilities for freight and travel both north and south.

Domestic Arts.—The citizens of Taylor are still inclined to follow the old manufacturing system, which was so popular in the days of our forefathers. The industrious women make large amounts of linseys, jeans, cottonades, linens, blankets, and other cloths, both for the use of the family and for traffic to the country merchants. They also supply these merchants with poultry, eggs, dried fruit, ginseng, butter, feathers, tree molasses, and home-made sugar. In this way they pay a large amount of the family expenses, and thus save large sums for their joint-tenancy

partners of the household. The men, who are fond of hunting, also, are enabled to create some wealth, in a small way, by means of peltries and fox scalps. Although no large sums are here employed in manufacturing establishments, yet there are grist and saw-mills, tanneries, and various mechanic shops in the county, sufficient to supply the needs of the agricultural population.

TOWNS AND VILLAGES.

Campbellsville, the seat of justice, is situated on Buckhorn creek. It has a population of 600, and, beside the usual public buildings, contains two academies, wool-carding factory, grist and saw-mill, shingle factory, four churches, a dozen mechanic shops, and several elegant private residences.

Bucna Vista, formerly *Mannville*, is a handsome village of 100 inhabitants.

Saloma is a thriving place of about 90 people.

Tampico, *Pittmansville*, *Woodville*, *Willowtown*, and *Sugar-tree Branch* are small, neat villages.

Schools and Churches.—There are two high schools at Campbellville, each of which is liberally patronized by the citizens of the town and the adjacent country. The free common schools of the State are now being taught in nearly all the districts, and the people are becoming better acquainted with the system. The attendance at the schools, though not so good as it ought to be, still is much improved from what it formerly was, and gets better each session. The Presbyterian, the Hard-shell and Missionary Baptist, the Methodist, Catholic, Reformer, and Episcopalian are the principal Christian sects in the county. The “meeting-houses” are generally comfortable structures, and the congregations large.

Miscellaneous.—This county needs railroads. The want of facilities for transportation is a great drawback to the prosperity of the country. The stimulus of a railroad is needed to infuse new life into all branches of business, and to carry the great and increasing productions to market. At present everything is hauled a long distance to the Louisville and Nashville Railway, which is exceedingly burdensome. The people have suffered the county to subscribe stock for the Cumberland and Ohio Railway, but it is not yet built. We hope it will soon take a new start, and be speedily completed. The farmers, also, have need of more light upon the proper system of fertilizing their worn lands, so as to bring them back to their virgin richness. This can be done by skill-

ful tests, and experiments with chemical fertilizers and home-made manures. (See article on Fertilizers.) Subdivision of the farming industry is needed, so as to turn the attention of the farmers more to orchards, vineyards, and sheep husbandry, in which more profits can be found for less labor than in altogether hoed crops. (See articles under these heads.)

Social Status—In no county is there more real honest worth among the masses than in Taylor. We learn that an enterprising colony of over 100 families of Pennsylvania farmers a few years ago settled in this county. This is but a beginning of the good work which is to give a new impulse to the energies of our people. We hope these will induce others to come, and that all parts of our State will feel the invigorating influence. The citizens of Taylor are intelligent, hospitable, and industrious; but colonies from other States will infuse new life, and start the wheels of progress into an accelerated motion.

TODD COUNTY.

In the year 1819 this county was taken from parts of Christian and Logan, and named in honor of Col. John Todd. It is situated on the southern border of the State, and is bounded on the north by Muhlenburg, east by Logan, south by the Tennessee State line (which separates it from Montgomery and Robertson counties in that State), and west by Christian county.

Rocks and Soils.—The geological formation of this county is very similar to that of Christian and Logan counties. More than half of the county is based upon the cavernous limestone formation of the sub-carboniferous series. This embraces all the good lands in the southern and central part, while the north of the county is on the conglomerate and mill-grit sandstone underlying the true coal measures. The great thickness of all these stratifications accounts for the immense bluffs, some of them over three hundred feet, to be found on Clifty creek and its tributaries. There is no coal in the county worth mining, and but slight indications of iron or lead. The soil on all the limestone lands

which are level, is fertile and well adapted for the growth of corn, wheat, and tobacco. As wheat and tobacco land it far excels the far-famed blue-grass soils, but it will not grow hemp or blue-grass to advantage. The northern part of the county is hilly, broken, and of thin soil, which, however, produces a very fine article of tobacco, and fair wheat and corn crops, and better grasses than the richer limestone lands. Originally all the cavernous limestone were prairie or "barrens," with only a few scrub oaks growing upon spots protected from the ravages of the "yearly burnings" which the Indians gave the grass on their hunting excursions. This grass was coarse, and called "barren or prairie grass," it was very tender and succulent when young, but hard and tough when fully matured, which condition it reached about August and September. It grew to the height of from three to eight feet, and so luxuriantly as to hide completely deer, buffalo, wolves, and all other animals, when sheltered among it. When it became dry in the fall of the year it was as combustible as tinder; and would burn so rapidly that thousands of deer, rabbits, turkeys, and other game were destroyed before they could escape to the timber or creeks.

Crops and Fruits.—The *king* of the crops here is tobacco, which is cultivated every year to the full capacity of the labor of the farmers, and sold in the markets of Hopkinsville and Louisville, Kentucky, or Clarksville, Tennessee. The "Hopkinsville or Clarksville Shipping Leaf," the most desirable article for export grown in America, grows on the cavernous limestone soils of this section of the State. It is remarkable for its great tenacity, the amount of nicotine and potash with which it abounds, and its capacity for absorbing water; hence, the demand for it by those countries where the duty on tobacco is large, in order to mix with inferior grades of native tobacco or other substitutes. Next to tobacco comes corn, and then wheat, these three being *the staples* of the county. Other crops, however, grow finely, such as barley, oats, rye, potatoes, flax, timothy, clover, redtop, orchard-grass, Hungarian, millet, &c., &c. Fruit does well everywhere, but particularly on the free-stone lands, where even peaches rarely ever fail of producing a full crop. Vineyards, so far as they have been tried, succeed well, and as much as ten thousand pounds of excellent berries can be raised on any good native vines, such as the Concord, Ives Seedling, Hartford Prolific, &c., &c.

Live Stock.—Through the influence and public spirit of the late Col. Samuel B. Jessup and his sons, and Dr. S. Leavell, E. G. Sebree, L. Garth, and some few other first-class farmers, the very best pedigrees of

horses, cattle, sheep, hogs, and poultry have been introduced into this county, and now a large proportion of the different classes of stock are of good blood, and very profitable for raising. A large number of first-class mules are bred each year for the Southern market, and hogs and cattle for the South, the Louisville, and home markets. Sheep husbandry would pay well in the northern part of Todd, and bees will flourish here as well as in any part of the Ohio Valley.

TOWNS AND VILLAGES.

Elkton, the county seat, is beautifully located on Elk creek, about the centre of the county, immediately on the turnpike road leading from Hopkinsville to Russellville. It has a population of about 1,200 persons, and contains a good court-house and other public offices, half a dozen elegant churches, two large academies, mills, a tannery, woolen factory, a bank, a dozen mechanic shops, and many handsome residences.

Trenton, nine miles southwest from Elkton, on the Evansville, Henderson, and Nashville Railroad, is a neat town of 300 inhabitants. From this place is shipped large quantities of tobacco, wheat, corn, cattle, hogs, and other country produce.

Allensville, another large shipping point, is located on the Memphis and Louisville Railroad. It contains over 400 inhabitants, and is growing rapidly.

Haydensville and *Guthrie*, on the same road, are places which do a large shipping business, and sell quantities of dry goods and groceries. The latter place is also the crossing of the Evansville, Henderson, and Nashville Railroad, and is located immediately on the State line of Tennessee.

Daysville, *Sharon Grove*, *Clifty*, *Kirkmansville*, *Pilot Knob*, and *Hopper's Tanyard* are thriving villages, each doing a considerable local trade.

Schools.—There is an excellent academy in operation at Elkton, under the charge of Prof. A. F. Williams, which is ably conducted and well patronized by the citizens of Todd and the adjoining counties. There are also several private high and select schools in the county, and the public State free schools taught in each district; so that there is no difficulty in having every child receive a good education at a comparatively small cost.

Churches.—The Hard-shell Baptist, Methodist, Missionary Baptist, Reformer, Presbyterian, Episcopalian, and Universalist are the principal

religious societies in the county. The church buildings are located in every neighborhood, and are well attended on the Sabbath.

Smaller Industries.—In that portion of the county where tobacco reigns supreme, but little attention is paid to domestic manufactures; but in the northern part of the county the good, industrious ladies still keep up the old way of making, on the hand-loom, jeans, linseys, cottonades, linens, counterpanes, and such other cloth as is needed for family use, and a considerable surplus for traffic to the country merchants. They also trade largely, for dry goods and groceries, in poultry, eggs, butter, beeswax, honey, home-knit socks, dried fruit, feathers, maple sugar, tree molasses, and ginseng root. There are but few large-class factories of any kind in the county, if we may except saw and grist-mills, and wool-carding, tobacco stemmeries, and blacksmith-shops.

Social Features.—The people of Todd are nearly altogether descendants of Virginians and North Carolinians, and keep up the old hospitable habits of those States, even to the peach and honey or mint julep before breakfast, and the iced toddy before dinner. They are well educated, refined, and chivalrous in their bearing, and delight in having everybody who visits them feel that they are at home, and perfectly welcome. There is no false aristocracy or pride of wealth; but every man takes his position according to his intelligence, industry, and moral worth. They greatly desire emigrants to come and settle among them.

TRIGG COUNTY.

This county was formed in 1820 from parts of Christian and Caldwell, and named in honor of Col. Stephen Trigg. It is bounded on the north by Lyon and Caldwell, east by Christian, south by the State of Tennessee (Stuart county), and west by Calloway, Marshall, and Lyon counties.

Geology.—The sub-carboniferous rocks underlie the entire county, except a few sandstones on the top of the knobs in the northern parts of the county, which belong to the Chester Group. Between the Cumberland and Tennessee rivers, on the hill land, the timber is excellent,

as it is also in the territory next to the Cumberland river and along the Little river ridges; but the east half of the county was originally part of the "barrens," and, while it is an exceedingly fertile level plateau, formerly was quite destitute of trees, yet was covered with a most luxurious and nutritious grass, similar to the prairie grass of Illinois. There is no coal in the county, but a great abundance of limonite, pot, and brown hematite iron ores, and some traces of the sulphurets of lead. The iron ores are in quantities practically inexhaustible, particularly in that part of the county which lies between the Cumberland and Tennessee rivers, and the country adjacent to the north bank of the Cumberland. There are several large furnaces and iron works in the county, which have been in successful operation for more than a third of a century. The surface of the country between the rivers is hilly, broken, and rocky. Near the north bank of Cumberland the surface is hilly or rolling, and in the eastern part of the county very level and rich. The soil, wherever the rocks and hills are not too prevalent, is well adapted to the growth of tobacco, wheat, corn, oats, rye, barley, potatoes, and all the hay grasses. Where the lands are hilly, the best fruit grows to perfection.

Agriculture.—Tobacco here is *king* of crops, with corn, wheat, rye, oats, and the hay grasses, all produced in lavish abundance. The lands are fertile wherever they are level, and the red clay subsoil, if exposed to the rains, winter freezes, and sunshine, becomes first-class soil. The quality of tobacco is the same as the heavy "Hopkinsville Shipping Leaf" raised in Christian, Todd, and Logan counties. The wheat crop of this county is of a quality unsurpassed in the valley of the Ohio, while the clover and hay grasses make hay of the very best quality. In live stock this county is fully the peer of her neighbors. The scrub breeds still predominate; but of late years such enterprising, public-spirited farmers as A. Quick, Esq., General J. W. Gaines, D. D. Wall, Chas. H. Major, J. P. Nance, W. D. Grace, Major J. Bingham, G. S. Wharton, E. C. Spiceland, and others, have been improving their stock, and importing choice breeds, until now many animals of good pedigrees can be found in different parts of the county. Large numbers of mules and hogs are every year sent to the Southern markets for sale, which bring a considerable revenue into the county. Sheep husbandry would do well on the hill lands if it were not for the large number of worthless curs that have a weakness for Trigg county mutton. Orchards and vineyards do well on the ridges and hilly parts of the county, and no

doubt, if proper pains were taken with the native varieties of vines, such as the Catawba, Ives Seedling, Concord, Delaware, and Hartford Prolific, that berries and wine could be produced as largely and as profitably, if not more so, than in either Ohio or Missouri. Over 10,000 pounds of Concord or Ives Seedling can be produced to the acre, and 800 gallons of excellently flavored wine, with fine body and a good bouquet, can be made from them at but little cost. (See method of wine-making, Washington county.)

TOWNS AND VILLAGES.

Cadiz, the county seat, is beautifully located on the north side of Little river, a little north of the centre of the county. It contains a population of about 800, has a fine brick court-house and other public offices, handsome churches, grist and saw-mill, carding factory, an academy, a dozen mechanic shops, and several elegant private residences.

Canton, on the east bank of Cumberland river, is an important shipping point, with a thriving population of about four hundred persons.

Roaring Spring, which takes its name from a large cave spring, which has considerable fall in passing from one limestone bluff to another, is a very handsome town of one hundred and fifty inhabitants.

Rockcastle is a considerable shipping point, with some one hundred inhabitants.

Wallonia is a beautiful village of some one hundred and twenty-five inhabitants, situated in the north of the county, on one of the branches of Horse creek.

Cerulean Springs, *Linton*, *Montgomery*, *Lindsay's Mills*, *Empire Iron Works*, *Laura Furnace*, *Trigg Furnace*, *Golden Pond*, and *Maple Grove* are neat, thriving villages, each doing the necessary commercial business of its neighborhood. Cerulean Springs is one of the most noted watering-places in the State, where hundreds of invalids come every year to drink the excellent life-restoring mineral waters that here flow from a fissure in the limestone rocks. It is owned by Mr. Hicks, an intelligent, enterprising gentleman.

Churches.—The Hard-shell Baptist, the Methodist, Universalist, Reformer, Presbyterian, Catholic, Missionary Baptist, and Episcopalian are the principal religious Christian denominations. A few Unitarians and Swedenborgians are scattered through the county, but they have no associated societies. The church buildings are generally good specimens of architectural skill, but not so fine as are to be found in some of the counties, where the large cities introduce more of fashion and less

of real moral worth and true piety. The people are intelligent, well-instructed, and progressive, and have more pride in good deeds, high-toned morality, and unquestioned faith, than in the high sounding sermons of luxuriously fed, fashionable preachers, who lengthen their discourses according to the pay received.

Schools.—There are good academies at Cadiz, Canton, and Roaring Spring, and private schools in different neighborhoods, beside the free public schools, taught under the State system, in every district.

Navigation.—This county is not blessed with any railroads or *railroad debt*, but has two first-class rivers—the Tennessee on its western border, and the Cumberland running centrally through it from south to north. It also has Little river, which is navigable for very small crafts to Cadiz, besides several small streams, which afford fine water-power for mills. No part of the county is very far from navigation, and those parts most distant from the rivers are within reach, by a few miles travel, of the railroads in Christian and Caldwell counties.

Industries of the People.—Farming, mining of iron ores, mercantile business, and manufacturing are the principal employments of the citizens of Trigg. Farming is done on a large scale, as is also the mining and working of iron, sawing lumber, grinding wheat and other grain. Many farmers are employed in the raising of live stock to be fattened and sold on the hoof. The *lesser industries*, such as spinning, weaving, &c., &c., are left altogether to the industrious, energetic female portion of the population, who, by their superior skill, produce excellent samples of jeans, linseys, cottonnades, counterpanes, home-knit socks, and other articles necessary for home consumption, or for traffic with the country merchants. They also market large quantities of poultry, eggs, butter, flaxseed, feathers, beeswax, and ginseng, thereby adding much to the common treasury of the family. A more energetic, thrifty, intelligent, virtuous, and handsome community of ladies than those of Trigg, who thus come forward as the helpmates of the lords of creation, cannot be found in America.

Immigration.—Trigg is a good county, whether we take it for farming, mining, fruit-raising, or manufacturing; and persons who come from other States or countries will here find a most polite, sensible, hospitable people, ready to welcome them with open hands whenever they conclude to settle within the borders of their territory.

TRIMBLE COUNTY.

In 1836 this county was established, and named in honor of Judge Robert Trimble. It was taken out of parts of Oldham, Gallatin, and Henry, and is bounded on the north and west by the Ohio river, which separates it from Jefferson county, Indiana, northeast by Carroll, southeast by Henry, and south by Henry and Oldham counties.

TOWNS AND VILLAGES.

The seat of justice is *Bedford*, a neat town of 250 inhabitants. It contains a good court house and other public offices, three churches, grist and saw-mill, wool-carding factory, half a dozen mechanic shops, an academy, and several elegant private residences.

Milton (opposite Madison, Indiana), on the Ohio river, is a considerable shipping point, and has a thrifty commercial population of about 300.

Kingston, also on the Ohio river, has about 100 inhabitants.

Winona (formerly Palmyra) is a very pleasant village, five miles north of Bedford, and *Ewingford*, the same distance southeast, has a population of 30.

There are no railroads in the county, but the Louisville and Cincinnati Short-line Railroad skirts the entire eastern border.

Geology and Soil.—Like the other counties adjacent to the Ohio and Kentucky rivers, Trimble is based upon rocks of the lower and upper Silurian date. The strata which come to the surface vary exceedingly in the number of fossils they contain. This gives a great variety to the soils. The surface of the country is broken and hilly, and the general horizon is from 250 to 350 feet above the Ohio river. In parts of the county the hills are characterized by that peculiar mud-stone rock so frequently met with in Boone and Gallatin counties. Wherever this comes to the surface, there will be seen the sobby beech lands. These are too wet in their natural condition for good crops, but can be made, by proper under-drainage with tiles, first-class soils for corn and meadows. The land of the county, though rolling, is quite rich and highly productive. It is peculiarly adapted to the growth of blackberry bushes, dewberries, and barberries. From these fruits, no doubt, profit could be derived, if the attention of the people was turned to them, as in

North Carolina and parts of Tennessee. There are no minerals worth mining in Trimble, although some traces of lead and the sulphurets of barytes may be found in the "birds-eye" limestone of the lower Silurian, similar to those of Franklin and Woodford counties. Some excellent building limestones outcrop in the hills, and specimens of fair gypsum have been found in different localities, but in small quantities.

Streams.—The Ohio river, which forms the west and part of the northern boundary, gives excellent steamboat navigation to every neighborhood of this county (which is one of the smallest in the State), and also furnishes bottom lands equal in fertility to any in the West. The Little Kentucky river rises in Henry, and flows through the entire eastern part of this county, affording good water-power for mills and factories. The other streams are short, small creeks.

Agriculture.—The leading industry of Trimble is soil-tillage. Nine tenths of the population live on farms and cultivate the soil. The lands being rich, produce hemp, tobacco, flax, corn, wheat, barley, rye, oats, potatoes, blue-grass, the hay grasses, and fruits of all kind to perfection. The tobacco grown on the oak and hickory lands is exceedingly fine in texture and beautiful in color, and ranks in quality with the fine cutting leaf of Owen. The corn is as heavy as that of Woodford or Bourbon, and ranks high for whisky-making. The wheat soils can be greatly benefited by an application of one hundred pounds of salt, and two hundred pounds of bone-dust to the acre, sown broadcast at the time of seeding, or even on top of the lands during the month of March or April, when the farmers are sowing clover seed. If sown in the spring, a large sharp harrow should be run over the land, which, in addition to covering the clover seed and compost, will improve the wheat. In live stock Trimble is an average county. Here can be found good breeds of horses, jacks, cattle, sheep, hogs, and poultry. The attention paid to blooded stock has increased considerably since the completion of the Cincinnati and Louisville Short-line Railroad, which affords quick and easy transportation facilities to every neighborhood in the county. Apples, peaches, cherries, plums, pears, quinces, and other fruits and berries, are now produced in quantity for shipment to the markets of Louisville and Cincinnati. In blackberries, Trimble beats the world, except of course North Carolina, Georgia, and parts of Tennessee. Vineyards do well, particularly when planted with the improved native varieties of vines. The hardiest single variety seems to be the Con-

cord. Sweet and Irish potatoes and melons appear to be especially adapted to the soil of this county.

Minor Industries.—The proximity and convenience of the markets of Louisville, Covington, and Cincinnati, since the completion of the "Short-line Railroad," has wrought a great change in the farming system of the bordering counties, and among the rest upon Trimble. The plan of garden-farming on a few acres well fertilized is found by experience to be better than the old plantation system. Accordingly we find many of the farmers of this county employed in planting and managing orchards, vineyards, dairies, and vegetable gardens, instead of large staple crops. They also produce for market poultry, eggs, dried fruit, cider, vinegar, pickles, can fruits and vegetables, pigs, calves, lambs, and scores of other smaller things, which are purchased by the city hucksters, who come to the depots prepared to buy whatever the farmers have to sell.

Churches and Schools.—The energetic public school commissioner, V. H. Abbott, Esq., has succeeded in having the free common public schools, on the State system, introduced into every district. He says: "Common schools are improving. We have had a better class of teachers, principally young men, who are trying to educate themselves, and a few young ladies who engage with us in the work, who are worthy of the name of teachers." There is a well-conducted academy at Bedford, where the higher branches are taught. The Baptist, Methodist, Presbyterian, Catholic, and Reformer are the principal Christian sects. The church buildings are good and the congregations large.

General Observations.—Ease, peace, and plenty characterize this county. Economy is the ruling trait of the citizens, and they mingle with their labors many of the pleasures of life. Desirous of a competency, but unambitious for great wealth, they occupy that blissful condition most favorable for happiness—not so poor as to require unremitting toil, nor so rich as to make labor unnecessary. Every farmer works, makes money, and keeps it at home. The prowling dogs keep sheep husbandry at a low ebb, while the farmers swear and the bird-hunters rejoice. The blue-grass that clothes the hills in such beautiful green, and the rich friable soils, invite garden farmers and stock-raisers from abroad, to whom the people would give a hearty welcome.

UNION COUNTY.

This county took its name from the poetic idea of the *happy union* of the States. It was taken from the west end of Henderson in 1811, and is bounded on the north by the Ohio river and Henderson county, on the east by Henderson and Webster, on the south by Webster and Crittenden, and on the west by the Ohio river, which separates it from Gallatin and Hardin counties, Illinois.

Streams, Geology, and Soil.—No county in the State has been more thoroughly examined by the State Geological Surveys than Union, and of none has a more exhaustive description been made. (See old and new series Geological Survey.) All the territory of this county is based upon the true coal measures of the Western Kentucky coal field. The most distinguishing geological feature of this district consists of its coal beds, which are co-extensive with the county. The surface of the country is in some parts level or gently undulating, and in others hilly and rough. There are several small ranges of hills or ridges, varying in height from 250 to 350 feet above the water level of the Ohio river. These are known as the Bald Range, Tradewater Range, Anvil Rock Hills, Bethel and Eagle Creek Hills, &c., &c. There exists also in the county frequent spots of wet glady lands, known as "post oak flats," which are too wet for farming purposes, unless well drained; they then become good corn and meadow lands. There are not less than twelve beds of bituminous coal in this district, beginning at No. 1 (the lowest) and running to No. 12. These vary in thickness from six or ten inches to nine feet in different parts of the coal field. There is no coal bed below the millstone grit and conglomerate sandstones, which form the bluffs on Tradewater river skirting the coal beds.

The principal streams are the Ohio river, which forms all the western line of the county, affording steamboat facilities to every neighborhood, Tradewater, which forms the southern border line, and has water enough for slack-water navigation, if dams and locks were built, Highland, Pond Fork, Cypress, Crab Orchard, Lost, Anderson, Casey, Big Mason, Hines, Locust, and Pearson's creeks. Iron ores are found in connection with the coal beds in various parts of the county.

The primitive forests were very heavy, of which 60 per cent. is still untouched by the woodman's axe. The principal growth on the flat

lands is cotton-wood, swamp ash, box elder, pecan, red oak, white oak, water oak, Spanish oak, sweet gum, black gum, red-bud, and, in swampy places, cypress and crooked wood. On the uplands are the ash, poplar, white, black, and red oak, gum, and hickory, with some few sugar-trees. The undergrowth is dog-wood, witch-hazel, spice-wood, papaw, sassafras, grape-vines, pea-vines, cane, &c. There are two distinct ranges of "post oak flats" (running eastwardly) south of the Bethel range of hills. These have a light-colored soil, and nearly impalpable silicious earth. With the exception of the post oak glades, the bald ridge range, and the hills and bluffs of the millstone, seen in the southwest corner of the county, and at one or two points to the north of Tradewater (as at Longsport and Montezuma), the soil of the county, which has been chiefly made from the quaternary loams, is of a superior quality, easy of cultivation, yielding most abundant crops of tobacco, corn, wheat, barley, rye, oats, clover, hay grasses, and potatoes. From the coal mines on Tradewater, at Caseyville and other points, millions of bushels of coal have been sold to steamboats, and exported to places on the Ohio and Mississippi rivers. The iron ores have never been utilized. Large amounts of timber, in the shape of logs, planks, and staves, are annually sent to New Orleans, from whence it finds its way generally to the European markets. Some lead ore and sulphurets of barytes are met with, the latter in considerable abundance. There is probably no better average county for clean crop farming lands in Kentucky than Union. There are numerous mineral springs in the county said to possess fine medicinal qualities.

TOWNS AND VILLAGES.

Morganfield, the county seat, is handsomely located north and west of the centre of the county, within a most beautiful and fertile section of country. It contains a population of between 600 and 800 persons, one of the best court-houses in the State (cost, \$60,000), an academy, grist and saw-mill, tannery, wool-carding factory, a dozen mechanic shops, and several elegant private residences.

Uniontown, on the Ohio river, seven miles north of the county seat, has about 1,200 inhabitants, and is a place of decided commercial advantages. Large quantities of tobacco are stemmed and shipped from this point, mostly to England.

Caseyville, on the Ohio river, near the mouth of Tradewater, has a population of about seven hundred, who are mostly connected with coal mining.

Clayville, Francisburg, Locust Port, Raleigh, DeHaven, Gum Grove, Huntsville, Boxville, Seven Gems, and Bordley are all neat, thriving villages, each doing a considerable local trade.

Agriculture.—Nine tenths of the people of Union county (leaving out those engaged in coal mining) are employed in tilling the soil, and live upon their farms. The principal staples are tobacco, corn, wheat, oats, and hay. The largest crops of corn and tobacco grown in the State, in proportion to population, are in this county. The best average of hay lands is also in Union. The large corn and hay crops necessarily will make this district one of the very best for hogs and mules, as well as for other classes of live stock. It is doubtful whether a larger population can be supported in any county of the Mississippi Valley (according to size) than in Union. All kinds of fruit do well, especially on the hills and ridges, and very rarely ever fail to yield a fair average crop. As yet but little pains have been taken to introduce into this section of the country the finer breeds of horses, cattle, sheep, or hogs. The old scrub stock, improved by heavy feeding with corn and hay, show to good advantage, and are really profitable. Some of the more enterprising farmers are beginning, however, to introduce better breeds, which will, no doubt, if continued, within a few years place this among the leading stock counties of Kentucky. Sheep husbandry does well, except for dogs, which have here a most amazing love for the taste of Union county mutton. There are in some parts of the county nearly as many dogs as sheep.

Other Industries.—There are numerous grist and saw-mills in this county, where flour is manufactured for export, and where millions of feet of lumber are sawed annually for shipment to New Orleans and other places, much of which goes even to Europe. Tobacco factories are quite common, at which the fine stemming leaf is prepared for the English and other markets. The good, industrious, intelligent women also manufacture, on the hand-looms at home, large quantities of cloth, both for family use and for traffic. They also supply the country merchants with eggs, butter, home-knit socks, poultry, and dried fruit, in exchange for dry goods and groceries.

Schools and Churches.—Prof. J. S. Austin has a well-managed academy at Morganfield. "The St. Vincent Female Academy," under the charge of the Sisters, is located some four miles east of Uniontown, and seven miles north of Morganfield. This is a first-class female institution, well patronized by the citizens of Union county and the southwestern

part of Kentucky. There are several other Catholic schools of merit in different parts of the county. The free common schools, under the State system, are taught in nearly all the districts of the county. The Catholic is the leading Christian denomination in this county. There are also numerous societies of Baptists, Methodists, Reformers, Presbyterians, and Episcopalians. The church buildings (particularly those of the Catholics) are well built, handsome structures, and these and others are scattered through the county, so that one or more can be seen in every neighborhood. The members are intelligent, pious, working Christians, remarkable for their freedom from intolerance or fanatical proscription.

The People.—Nowhere in Kentucky will be found a more noble, hospitable, intelligent, and moral community than in Union county. There are no very poor persons in the county. The court dockets are sparse of cases, and the jails generally empty. Everybody works, and no one is so rich as to make him purse-proud or aristocratic. The ladies are refined, modest, and exceedingly fine housekeepers, filling well the places of helpmates to their husbands and ornaments to society. Immigrants will find here a hearty welcome, and a choice county in which to make permanent homes.

WARREN COUNTY.

In 1796 this county was cut off from Logan, and named in honor of Dr. Joseph Warren, who fell at the battle of Bunker Hill. It is bounded on the north by Butler and Edmonson, east by Barren and Allen, south by Allen, Simpson, and Logan, and west by Logan and Butler counties.

Streams and Geology.—This county is one of the largest in the State. It lies in the southern central portion of the Commonwealth, upon the waters of Barren river, and is underlaid generally by the sub-carboniferous or cavernous limestones. The upper strata of this formation prevail most generally on the farming lands of Warren. There are no coal or ores in this county, unless there may be occasional small deposits of

hydrated oxides of iron in the southern part, and some light beds of coal on the tops of the ridges in the northern part, where the mill-stone grit and others of the Chester Group prevail. In the vicinity of Bowling Green are beds of the sub-carboniferous limestone, of about one hundred feet in thickness, which rises above the level of the city. From the top of this terrace there is a most excellent and commanding view of the valleys of Barren and Green rivers, the streams flowing through fine bodies of land, resting on the cavernous limestone, bounded on the north by a distant range of mill-stone grit and conglomerate sandstones, from two hundred and fifty to two hundred and seventy-five feet above the valleys. The strata of the sub-carboniferous limestones here are not so thick as they are in the counties lying further west; in fact, they seem to thicken gradually all the way to the sudden escarpment on the Tennessee river. In many parts of the county the rocks lie so close to the surface as to seriously injure the agricultural value of the lands. This is particularly the case where the level lands begin to rise towards the ridges. In some places there is a bed of light-colored argillaceous marl several feet thick, reposing on ledges of limestone, with a red clay lying above it. Unfortunately this marl is lacking in sulphuric and phosphoric acid and potash; otherwise, it would be exceedingly valuable for fertilization. The general surface of the country lying on the cavernous limestone is level or gently undulating, while the northern part of the county, based on the sandstone, is quite hilly and broken. There are hill spots or rocky knolls also in places on the "barrens."

The soil on all the level lands is exceedingly rich, and abounds in all the elements of plant food needed by the staple crops of the country; but the ridges, knobs, and sandy soils are thin and unproductive. Green river forms a part of the northern boundary, and Barren river runs centrally through the county from southeast to northwest, and empties into Green. Each of these streams are navigable the entire year for steamboats, through means of locks and dams. The tributaries of Barren river are Clifty, Brushy, Clear, Rockhouse, and Necked Forks of Gasper, Gasper, Salt Lick, Dickerson, Mare creek, Ray Branch, Jennings's, Cuthbertson's, Bay, Trammell, Link, and West Fork of Drake creek, Drake creek, and Joy creek. The last named flows into Green river.

Agriculture.—This is a leading agricultural county, and upon the level and rolling lands the leading staples are tobacco, corn, wheat, barley,

rye, oats, clover, the hay grasses, and potatoes. All of these grow to perfection, and scarcely ever fail of making an average crop. The tobacco grown here is similar to the "Hopkinsville Shipping Leaf." The large corn and hay crops and clover pastures make Warren a good county for hogs, sheep, and mules. Large numbers of these are every year driven South, or shipped to the Louisville market. Of late years many thousand hogs have been killed at the pork-houses in Bowling Green. Owing to the indigenous growth of white clover and other flowering plants and trees of this section, bees flourish here amazingly, and honey can be produced in unlimited amounts at very little cost, excepting the care necessary for protecting the bees. No part of Kentucky can beat the knolls and ridges of Warren for apples, peaches, pears, cherries, plums, and other classes of fruit. Vineyards, so far as they have been tried, have proved a success, and much excellent wine is made every year by amateur vintagers. Previous to the civil war, the peach and apple brandy of Warren county were noted throughout South Kentucky and North Tennessee, and it was next to high treason for any man to pass by Bell's tavern, on the old turnpike, without calling for "old peach and honey." But, alas! the face of the revenue collector is seen in the land, and the freedom of the people is heavily burdened, and their privileges curtailed, and the mountain dew, the savory old peach, and the sparkling apple-jack, have all vanished like the mists of the morning. Possibly the time may come when freedom of action will return, and the abridgment of privileges will be revoked, and the hearts of the people will again rejoice as in days "lang syne;" if so, may we be allowed here to ask of the future Warrenites the favor that they will then drink, from glasses filled with good old peach and honey, *in silence*, to the memory of us (this generation) who once enjoyed these blessings, but have long been denied, and perhaps forever!

TOWNS AND RAILROADS.

Bowling Green, the seat of justice, is a most flourishing and growing city of between six and eight thousand inhabitants. It is located on a beautiful romantic plateau on the west bank of Barren, where the Louisville and Nashville Railroad crosses that stream, 112 miles from Louisville, and 73 miles from Nashville. It has the finest court-house in the State, except that of the city of Louisville (cost, \$125,000), and other public offices to correspond, two banks, twelve churches, four seminaries and high schools, a graded free public school, woolen factory,

railway machine shops, public water-works and fount, gas-works, agricultural works, tanneries, over 30 mechanic shops, and numerous elegant private residences. (See Cities and Towns, page 95.)

Other railway stations are *Smith's Grove, Oakland, Bristow, Memphis Junction, Rockfield, Richpond, and Woodburn*, all of which are thriving places, that do a large shipping business, beside the local trade.

In the county are also *Claypool, Elk Spring, Green Hill, Hadley, Honaker's Ferry, Martinsville, Rockland, Green Castle, and Richardsville*, all neat villages.

The Louisville and Nashville Railroad passes centrally through the county from northeast to southwest. At Memphis Junction, five miles from Bowling Green, it branches, one section running to Nashville, and the other to Guthrie, in Todd county, and thence to Memphis, Tennessee.

Smaller Industries.—The demands of the Bowling Green market upon the county is such that a large number of the farmers have changed from the old plantation system of soil-tillage, and become market-gardeners. These have planted orchards, vineyards, strawberry beds, and vegetable gardens; they also, as well as other larger farmers, raise poultry, pigs, lambs, and bees, and produce honey, beeswax, feathers, eggs, maple sugar, tree molasses, and small fruits and berries, all of which are sold to the citizens of their county city. Many of these articles are also bought up by hucksters every day, and forwarded by railroad to Louisville or Nashville. A considerable amount of sawed timber, corn meal, and wheat flour is exported by the owners of saw and grist-mills, and large amounts of dressed lumber sold to the country by the owners of the planing-mills. Other factories and mechanic shops, also, supply numerous articles for home use and export. There is little cloth made in the county upon the hand-loom, but a very large amount made by the woolen factory at Bowling Green, which is sold at home in part, and also exported.

Schools and Churches.—No county is better provided with schools than Warren. There are four high schools and academies in Bowling Green, beside the graded public schools. The common free schools, upon the State plan, are taught in nearly every district, and the people are becoming better acquainted with the system, and taking more pride in having their children attend regularly. The Reformer, Baptist (Missionary and Hard-shell), Methodist, Catholic, Presbyterian, and Episcopalian are the principal Christian denominations. The church buildings are, in the city, elegant, and in the country good, substantial structures, well

suited to the wants of the members. One or more of these are in every neighborhood, at which large congregations generally meet every Sabbath.

Miscellaneous.—The intelligent, social, hospitable citizens of Warren are quite progressive in their customs, and keep fully up with all the improvements of the age, as a general rule; they need, however, to learn how more skillfully to preserve and renovate their lands, which, in many places, show neglectful cultivation. These soils are suffering for want of deep plowing, green manures, and chemical fertilizers. No lands in the State could be more materially benefited, or have a better subsoil to retain the manures. (See article on Fertilization.) They also need a further subdivision of their large farms, and more garden-farming; they want more orchards, vineyards, poultry-yards, and small fruits, the products of which can be sent to the large cities—even to New York. So mote it be.

WASHINGTON COUNTY.

This was the first county formed after Kentucky became a State in 1792, and was named in honor of George Washington, then President of the United States. It was taken from a part of Nelson county, and is bounded north by Nelson and Anderson, east by Boyle and Mercer, south by Marion, and west by Marion and Nelson counties.

Geology and Soil—Wine-making.—The geological formation of this county is quite various. That portion lying northeast of a line drawn diagonally through the centre of the county and across it, from the southeast corner towards the northwest, is based on some of the best strata of the upper Cambrian or lower Silurian rocks, while the part lying southwest from this line is generally based on the upper Silurian, and in some places rises to the Devonian shale. The soil corresponds to the rocks. Dr. Owen, in his able Geological Report of the State, in volume 3, says: "The general character of the country on the northeast part of this county is much the same as that described in the western part of Mercer county. Land broken and rocky, but still productive,

often yielding from fifty to sixty bushels of corn to the acre in favorable seasons. The general experience of the farmers of this part of the county is, that deep plowing greatly improves the yield of the land, since the farmer who pursues this course often doubles the crop over that of his neighbor who plows shallow.

“The agriculturalists who reside in this part of the county would do well to try the grape culture on the steep hill-sides, liable to wash by frequent plowing. Vineyards are probably the most profitable application of such land, under judicious management. The making of wine is a much more simple operation than is usually supposed in this country: the main requisites are cool cellars, and the strictest attention to the cleanliness of everything used in the process of preserving and fermenting the juice. The expressed juice must be received into clean barrels, and allowed to ferment in a cool cellar. When the fermentation has ceased, the air must be excluded, and the barrel and its contents kept as cool as possible. This is even more necessary now than during the fermentation. It is not necessary to add any sugar, though some wine-makers prefer to separate the first expressed juice from the last product, to which they add a certain quantity of sugar, and make from it a sweet wine, while from the first pressings either a dry wine may be obtained, or a sharp, sparkling champagne wine results, by simple fermentation without the addition of sugar. The latter sparkling wine only requires to be bottled before the last portions of carbonic acid has had time to escape; this gas is condensed in the wine, and gives it the sparkling head. Age improves wine by the gradual change which the ethereal oily principles undergo, which improves their flavor; hence the high esteem in which old wines are held, and the increased price at which they are sold.” (See article on Grape-growing in Kentucky, page 217.)

In that part of the county above Mackville and Williamsburg is a soil well adapted to tobacco, underlaid by a mulatto subsoil. About the centre of the county, in the Pleasant Grove settlement, is first-class hemp and corn land, upon which very large poplar and papaw bushes originally grew in abundance. There is in this land some “shot-iron ore,” but not enough for profitable working. The white oak timber lands border on the good poplar section, which are very fine for wheat and the smaller grained cereals. The white oak timber is equal to any in the world for closeness of grain and toughness of fibre. There is no

coal in the county, and but a limited amount of black shale, small portions of shot-iron ore, and some little lead.

Live Stock.—The excellent blue-grass hay, clover, and corn raised in this county naturally make it a choice stock county; and the energetic farmers have not failed to keep even with their neighbors of Boyle, Mercer, and Nelson in the best improved breeds of all kinds of live stock and poultry. The "Red Berkshires" of Hon. Thos. A. Grundy are famous throughout the West as being of the best pedigrees of that class of swine. Mules in large numbers are sent from this section every year to the cotton plantations of the South, where they command extra fine prices on account of their size, hardihood, and blood. Bees do well in this section.

Crops and Fruit.—Hemp, corn, tobacco, and wheat grow equal to the products of any part of the "Blue Grass Region" on the lands in the central and northeastern parts of the county, and in the remainder all the cereals and tobacco do well. Fruit trees of all kinds flourish, and rarely fail to produce full crops.

Transportation Facilities.—The Cumberland and Ohio Railroad, which is in process of construction, has been located centrally through this county from north to south, and if completed, will give easy communication with all points north and south. The Lebanon Branch of the Louisville and Nashville Railroad runs parallel with and within a few miles of the southern border, and affords easy access to Louisville and Nashville. There are numerous rivers and creeks which supply good drainage and mill-sites, but none of them are navigable. The Elizabethtown, Lexington, and Big Sandy Railroad, when completed, will run diagonally through Washington, from northeast to southwest. Should these roads be finished, which is only a matter of a little time, no part of Kentucky will have better facilities for travel and transportation.

TOWNS AND VILLAGES.

Springfield, the county seat, is a handsome town of about 600 inhabitants, situated in the southern part of the county. It contains a good court-house and other public offices, several fine churches, wool and carding-mill, saw and grist-mill, half a dozen mechanic shops, two academies, and many elegant private residences.

Maxville has a population of 200, it is situated in the eastern part of the county, in a rich section of land, and does a considerable local trade.

Fredericktown, on Beech Fork of Salt river, has about 75 inhabitants. *Antioch*, *Hadesville*, *Beech Fork*, *Beechland*, *Sharpsburg*, *Texas*, *Willisburg*, *Brownsburg*, and *Mooreville* are all neat villages, each doing a fair local trade.

Schools and Churches.—Besides the academies at Springfield and several private schools in the county, the free common schools on the State system are taught in every district, and the people evince a great wish to have their children well educated. The Catholic, Baptist, Methodist, Reformer, Episcopalian, and Presbyterian are the principal religious denominations, each of which have good church buildings and large congregations in different neighborhoods in the county. The people are remarkably moral, intelligent, industrious, and hospitable, and live as well, happily, and contented as any community in the State. Immigrants seeking a good home and hearty welcome can find it here.

WAYNE COUNTY.

This county, named in honor of Gen. Anthony Wayne, was formed out of parts of Pulaski and Cumberland in the year 1800. It is bounded on the north by Pulaski, east by Pulaski and Whitley, south by the Tennessee State line (which separates it from Fentress and Scott counties of that State), and west by Clinton and Russell counties.

Streams and Timber.—This is one of the best-watered counties in the State. Cumberland river forms its northern boundary, which is navigable for steamboats. South Fork of Cumberland forms the eastern boundary, which could be easily made navigable by slack-water and the removal of some large conglomerate boulders which now obstruct the channel. Long creek, Beaver, Otter, Wolf, Cow-horn, Big Sinking, Middle Sinking, Turkey, Cedar, Dry, Johnson's, Long, Harman's, Kennedy's, Little South Fork, Fall, Carpenter, and War Nuckle creeks are all streams of good water-fall, affording many excellent sites for mills, furnaces, or factories.

Geology and Soil.—This county is particularly blessed in having a great variety of rock formations, and, consequently, corresponding soils.

Dr. Owen, in his Geological Report, says : "One half of the area of this county is embraced within the coal field which contains not only the five sub-conglomerate coals, but in the extreme southeast corner the large beds of the upper coal measures are said to show themselves. Like that of Pulaski, its coal area may be divided into three districts: one embracing all that high ridge land lying between the Big and Little South Forks and the Tennessee State line ; a second the ridges lying between the waters of the Sinking creeks on the east and the Elk Spring and Kennedy's creeks on the west ; and a third the highlands between Elk Spring creek and the Little South Fork, and between Otter and Beaver creeks. * * * No county on our line (of survey) is so favored by an equal distribution of farming and mineral lands as this. Rich, broad, and gently sloping limestone vales run up between the narrow ridges containing the precious minerals, while to the northwest extends throughout the county, in a broad band, that fertile limestone table-land paradoxically called 'The Barrens,' and below this elevated terrace, are the equally rich bottoms of the Cumberland river. 'The Barrens' have a gently undulating surface, of the red calcareous soils of the *Lithostrotion* division of the sub-carboniferous limestone ; and, at the period of the early settlement of this country, were nearly destitute of trees, being represented in the records of that day as having the appearance of open prairies covered with long, rank grass. But at present, where not under cultivation, they luxuriate beneath a heavy growth of timber, principally of black oak and black walnut, through which hickory, dogwood, and black gum are common. The surface, in many parts, is strewn with the yellow, cherty masses so commonly met with in Kentucky at this geological horizon, imbedded in a red clay soil, which, at some points, is at least twenty feet deep. A different kind, called 'nigger heads,' is found with them, and produces, when ground up, a manure said to be particularly adapted to the soil upon which it is strewn. Between the wide, rolling noses of the barrens are frequently to be met estuary-like bottoms, called 'flat lands,' 'craw-fish lands,' etc. These extend over wide surfaces between Otter and Beaver creeks, and grow timothy and herds-grass well, but trouble the farmer to get from them good crops of corn or grain. The timber is mostly white oak and pin oak, hickory, and sugar-tree. Specimens of the soils of this country have been carefully collected for analysis.

"The 'barrens' of this county are full of sink-holes, caused by the cavernous character of the underlying strata, spoiling the surface-drain-

age of the country, and compelling the farmer to sink deep wells for his supply of water, unless he lives near the edge of the great plateau, in which case he will be abundantly supplied from the large springs which issue from the face of the cliffs, and which, if utilized, could perform much of the lighter labor of the farm. The streams, which cut through the limestone in a northwest direction, fall rapidly, and would furnish abundance of power."

TOWNS AND VILLAGES.

Monticello, the county seat, on Beaver creek, about the centre of the county, is quite a handsome town. It contains a good court-house, an academy, mill, and carding-factory, several churches, half a dozen mechanic shops, and several nice private residences.

Mill Spring, Robertsport, Norman's Warehouse, Berryville, Weavertown, Newberry, Parmleysville, Coopersville, and Bellville are all neat, prosperous villages, with ample areas to make large towns, when the mining and agricultural resources of the county are fully developed.

Schools and Churches.—The State system of common schools is fast taking hold on the people, and will cause a much more intelligent public sentiment to control, than was formerly characteristic of this section of the State. The good sense and forethought of the citizens see the necessity of a better education among the free intelligent people, who are compelled to advance as the balance of the world progresses; and they are accordingly striving to have their children well taught in all departments of the public schools. The Old-fashioned Baptist, Methodist, Free-will Baptist, Universalist, Reformer, and Presbyterian are the principal religious denominations in the county. The church buildings are scattered throughout the county, so that one or two are in each neighborhood. These are not fine, showy specimens of architecture, such as you may find in Lexington or Louisville, but, doubtless, they contain altars, around which worship men and women who are the peers of the most pious in good works and undoubting faith to be found anywhere within the folds of Christian churches. The log house and rough bench seats stand as high in the sight of an all-wise and good Creator as cushioned pews and shining cupolas.

Domestic Arts.—The good, industrious, intelligent ladies, who are everywhere the salt of the earth, here do most of the manufacturing of the country, in making jeans, linseys, cottonades, linens, counterpanes, blankets, and other kinds of cloth, from wool, flax, and cotton grown at home; and with these they clothe the family and traffic with

the country merchants for "store goods" and groceries. They also trade to these merchants home-knit socks, beeswax, feathers, eggs, poultry, butter, ginseng, flaxseed, maple sugar, and tree molasses, for which they get many fashionable articles of dress, never forgetting the "duck of a bonnet," which sits as cosily on the heads of the country lasses in Wayne as on the crowns of the belles of the large cities.

Habits and Customs.—The distance from markets causes the people not to apply themselves so assiduously to labor as their brethren of the commercial counties. This gives them leisure to hunt, fish, and attend dances and frolics, log-rollings, house-raising, quiltings, and all the weddings in their neighborhoods. This creates that sociability and hospitality for which the people of Wayne are so noted, and has a tendency to bring on early marriages among the young people; so that it is one of the most rare things imaginable to find an old maid in Wayne county, and no old bachelors, except such as are forced, by necessity or triflingness, to remain in their pitiable condition.

Agriculture.—Farming is done on a smaller scale than in the blue-grass or regular "barren counties;" but yet every family makes enough for its own consumption, and some to spare. Tobacco, wheat, oats, rye, corn, flax, and cotton all do well in the valleys and upon the level lands; and on the hills and ridges are some of the best orchards in the State. Apples, pears, peaches, quinces, cherries, plums, &c., scarcely ever fail of full crops; and vineyards, so far as they have been tried, do well; in fact, were the people to turn their attention to wine and brandy-making, probably no part of the Mississippi Valley could excel Wayne county in the production of grapes, or in the flavor and bouquet of its wines. The native vines, such as Catawba, Ives Seedling, Concord, Hartford Prolific, and Delaware, would do best. These varieties could be made to produce over 10,000 pounds of grapes, and over 700 gallons of wine, to the acre. (See Wine-making, under the head of Washington county.) In live stock very little pains have been taken to improve the breeds; but the farmers are content to hold on to the "scrub stock," because "they can live on the range." When railroads are built through this section, then will come a great enhancement in the price of lands, and growth in the wealth of the country.

WEBSTER COUNTY.

This county was taken from parts of Henderson, Hopkins, and Union in 1860, and named for Daniel Webster. It is bounded on the north by Union, Henderson, and McLean, east by McLean and Hopkins, south by Hopkins and Crittenden, and west by Crittenden and Union.

General Characteristics.—Lying between Green river on the north and Tradewater on the south, Webster county presents all the varieties of surface and soil, from the overflowed bottom to the back-bone ridge. The basis of the entire county is of the true coal measures. There are some heavy bluffs and hills next to Tradewater, formed by the mill-stone grit and conglomerate sandstones. These occasionally outcrop in different parts of the county; but there are no sub-conglomerate coal beds here, as is the case in the southeastern part of the State. Next to Hopkins, this county has probably more workable beds of bituminous coal than any other lying in the West Kentucky coal field. At the town of Providence there are three beds of excellent coal exposed in a hill within a space of 125 feet, each over five feet in thickness. These and similar deposits exist throughout the county. A good quality of iron ore has been found in several localities, and some slight traces of lead, and the sulphurets of barytes, the latter in considerable quantities. Mineral springs are very numerous; copperas water is frequently met with, and some rich salt water. The mineral springs at Sebree City are quite celebrated for their medicinal virtues, and are much used by invalids. The timber is quite large, and about 60 per cent. of the lands is still in the native forests. The prevalent trees are white oak, black oak, red oak, Spanish oak, poplar, gum, hickory, dog-wood, and maple. The ridges are covered with shrubs, native grass, and bushes well-suited for sheep, and the mast of oak acorns and nuts in many places is sufficient to keep hogs generally fat through the winter. The surface of the country away from the rivers is rolling, and in some places hilly; but the soil is quite productive, being peculiarly adapted to the growth of tobacco, wheat, corn, and the hay grasses. Every river and creek gives wide bottoms of most excellent corn and meadow lands. In parts of the country, where the sandstones come to the surface, the soil is thin, but is free and easy to cultivate, and while fresh, produces good crops.

These lands could be greatly benefited by the application of lime or gypsum, and the turning under of green crops of peas, buckwheat, rye, spurry, or clover; even weeds turned under when green will tend greatly to renovate the soil.

Streams.—Green river, which is navigable all the year for steamboats, forms the northern boundary, and Tradewater, which could be easily improved by locks and dams, is the line on the south between this county and Crittenden. The other water-courses, which drain this county and afford many good mill-sites, are Deer creek, East and West Fork, Pittman, Clear, Highland, Crab Orchard, Cany Fork, Slover, Graves, Owen, Saline, and Mill creeks. On the bottom of the creeks and rivers are found some of the largest sycamore, poplar, white oak, hickory, and gum trees in the Mississippi Valley.

Agriculture.—Tobacco is *king* of crops in Webster; then come corn, wheat, rye, and the hay grasses, all of which grow to perfection. The tobacco is similar to that of Henderson and Daviess. In fact, the Webster county tobacco, which is nearly all sold at Henderson, has contributed as much as any other in giving character to the Red Bank Strips, so famous in the Liverpool and London markets. In size, this tobacco is larger than the "Hopkinsville Shipping Leaf," but it has not so much body or elasticity, and is less strong in nicotine. The fine corn and hay crops give profit to hog and mule-raising, numbers of which each year are exported to the South, or to the Henderson and Evansville markets. The scrub stock have full sway, and the people are so busy with their tobacco crops that they pay very little attention to fine breeds. Some good horses, jacks, and hogs have been introduced by a few energetic farmers, and these are fast being spread over the county. Although sheep-raising is so well suited for the climate and lands, yet very few sheep, comparatively, are to be met with in the county; first, on account of the great number of dogs, and then because the people have never learned the great profit there is in producing wool in a section where sheep will almost feed and take care of themselves. Bees are found in great quantity wild in the hollow trees of the woods, and from these most of the honey now used is taken. With the new fashioned hives and mel-extractors, honey-making would pay here largely. Fruits of all kind flourish exceedingly, and even peaches rarely fail of a full crop upon the highlands. Vineyards, so far as they have been tried, have proved a success. Before the war, a large quantity of peach and apple brandy was made by the farmers, principally for home consumption in the county.

TOWNS AND VILLAGES.

Dixon, the seat of justice, is a handsomely-built town of about 500 inhabitants. It is located about the centre of the county, and contains a good brick court-house and other public offices, three churches, an academy, three tobacco factories, steam flouring mill, saw and grist-mill, half a dozen mechanic shops, and several elegant private residences.

Slaughtersville, a thriving town of about 250 inhabitants, is located immediately on the St. Louis and Southeastern Railroad, and is one of the largest shipping points for tobacco on the road.

Schree City, also on the Railroad, is a place of considerable trade, and enjoys a fine reputation on account of its excellent mineral water. It is one of the most fashionable watering places in Southwestern Kentucky; population 250.

Providence, eleven miles south of Dixon, is a flourishing town of 200 inhabitants. The Madisonville and Shawneetown Railroad has been located through this town, and partially built (next to the Ohio river), but at present the work is suspended.

Steamport, on Green river, *Bellville* and *Montezuma*, on Tradewater, and *Pools Mill*, in the northwestern corner of the county, are neat villages, each with a large local trade.

Clayville, six miles southwest from Dixon, contains 200 inhabitants, and is quite an important tobacco manufacturing point.

Vanderburg is a beautiful village of 150 inhabitants.

Schools.—At Dixon and Slaughtersville are well managed seminaries, at which the higher branches are taught. Clayville Academy, under the able management of H. E. Echols, is a first-class institution. There are also other high schools in the county, beside the free common schools in every district taught under the State system.

Religious Societies.—The people of Webster are a moral, church-going community. The Hard-shell Baptist, Methodist, Presbyterian (Cumberland and Old School), Catholic, Missionary Baptist, and Reformer are the principal Christian denominations. The church buildings, or "meeting-houses," are plain, commodious structures, well adapted to the wants of the large congregations which generally assemble at them each Sabbath.

General Remarks.—Almost the entire population of Webster is descended from the good old North Carolina stock, and they keep up the habits and customs of that noble State, even to taking the anti-phlogistic mixture of "peach and honey" before breakfast. A more

social, intelligent, hospitable, kind community, cannot be found in Kentucky or the Western States. The women still keep up the custom of spinning and weaving nearly all the cloth that goes to make up the every-day wear, and quite a surplus for traffic to the country merchants. They also trade with these merchants in eggs, butter, poultry, dried fruit, home knit socks, tree molasses, maple sugar, and numerous other articles of home production. There are scattered throughout the county numerous tobacco factories, grist and saw-mills, and a number of mechanic shops, which are well patronized by the country people. There are large bodies of rich desirable land still unoccupied that the owners would willingly sell at low prices to actual settlers, who might come from other States or countries. To all such emigrants a hearty welcome would be given, and first-class farms and homes, with future riches, would be the rewards of their removal to this county.

WHITLEY COUNTY.

In 1818 a part of Knox county was cut off to make Whitley, which was named in honor of Col. Wm. Whitley. This county is located in the southeastern part of the State (immediately on the State border), and is bounded on the north by Pulaski, Laurel, and Knox, east by Knox and Bell, south by the Tennessee State line (which separates it from Scott and Claiborne counties in that State), and west by Wayne and Pulaski.

General Character.—Whitley is located altogether upon the rocks of the true coal measures of the Eastern Kentucky coal field, and contains an immense amount of good bituminous coal and iron ores. Here is found, in its proper position, the thickest and best defined sub-conglomerate coal beds in the State, overlaid by strata of proto-carbonate of iron, black band, and limonite ores. Ferruginous shales exist in thick beds, and the immense strata of conglomerate sandstone and mill-stone grit are found everywhere in tall, beetling crags and bluffs along the streams and ravines. The surface of the country, except in the bottoms, is hilly, broken, and mountainous. Two distinct ranges (offshoots

of the Cumberland Mountains) pass through this county westward of the great Pine Mountain *fault*, which runs through the southeast corner, in a direction from southwest to northeast. The Cumberland river, which enters this county from Knox, about the middle of the eastern border, runs centrally through until it reaches the neighborhood of the western border, where it turns abruptly to the northward, and runs for 20 miles or more in nearly a due north direction, through the west end of the county, till it intersects Laurel river, when it again turns at right angles and continues its course westwardly. About 14 miles below Williamsburg the Cumberland river leaps over a bluff of conglomerate sandstone perpendicularly 62 feet, after passing a rapids of about 10 feet. This precipitous fall of the Cumberland creates a roaring noise that can be heard for more than 10 miles. Along the bluffs of the creeks and rivers are immense numbers of laurel and other flowering shrubs, which, when in bloom, render great beauty to the landscape. The hills and mountains along the Jellico, Pine Mountain, and other ranges, rise one above another with a grandeur that is almost appalling, and present to the eye of the traveler scenery equaling that of the most romantic and picturesque countries of Europe or America.

Chalybeate and other mineral and salt springs are very numerous, and are said to possess excellent curative qualities. Some of the salt brine is so strong that it will make a bushel of salt from less than 60 gallons of water. The old stories of Swift's silver mines, which have been located at one time or another in nearly every county in Eastern Kentucky, have also been told on Whitley; and a company was formed in 1850 to work these mines, which were reported to be located at the falls of the Cumberland; but, upon a strict scientific examination, the mineral, instead of being silver, was only a good article of proto-carbonate of iron. In the same way the story of copper mines turned out a similar hoax; the metal, when analyzed, was nothing more than good specimens of hematitic iron ores. A skillful geologist will tell you at once that gold and silver, in true veins of these precious metals, only exist in company with quartz thrown up by *igneous action*, and wherever this action has been of sufficient force to break through the aqueous or sedimentary rocks, there are always the *Plutonic rocks* or metamorphic rocks brought to the surface. *No such rocks* have ever been found in Kentucky, and probably none exist, unless, perchance, they may be found along the axis of the great *fault* which runs from northeast to southwest along the edge of the Pine Mountain range, through Southeast Kentucky

into Tennessee. The Plutonic rocks do exist, however, on the east side of the Appalachian or Allegheny range of mountains, about 100 miles southeast from Whitley, in North Carolina, and also on the Unaka range of Tennessee; in each of which localities copper, silver, and gold are found in quantity. So our advice to everybody is, if you wish to find gold or silver in Kentucky, the safest way is through the channels of commerce, and by the cultivation of her rich lands, and by the development of her vast iron and coal resources. There may yet be fine beds of gypsum discovered in the mountain ranges of Whitley.

Streams, Soil, and Timber.—As before stated, Cumberland river runs through the county, and, with its tributaries, drains it perfectly. The principal of these are Jellico, Indian, Eagle, Morgan, Wolf, Elk, Mud, Cane, Clear, Patterson, Mulberry, Big Poplar, Slaughter, Bark Camp, Dog, White Oak, Young's, and Wall's creeks. Besides, there are South Fork of Cumberland and its tributaries, Roaring Branch, Beaver, and Marsh creeks; and the Laurel river with its tributaries, Lying, Whippoorwill, and Spruce. Most of these streams have good fall, and afford excellent sites for mills, factories, and furnaces. The soil on the river and creek bottoms is exceedingly rich, but on the hills is less fertile, and on the sand rocks and ridges is frequently poor and rocky.

This is one of the best timbered counties in Kentucky, being covered over with immense forests of all kinds of trees indigenous to the mountain counties of the State. There is over 80 per cent. of these forests still untouched by the woodman's axe.

TOWNS AND RAILROADS.

Williamsburg, the seat of justice (more frequently called Whitley Court-house), is a neat town, most romantically located below the mouth of Clear creek, on the south side of Cumberland river. It has a grist and saw-mill, the usual public buildings, two churches, a tan-yard, a school-house, and half a dozen mechanic shops.

Woodbine, Bark Camp, Wildcat, Pleasantview, Boston (Lot P. O.), Patterson, Evarts' Mill, Flat Rock, Rockhold, Mash Creek, Meadow Creek, and Young's Creek are all small villages, each doing the local traffic of the neighboring country. The only railroad is the Cincinnati Southern, which passes through the southwest corner of the county.

Agriculture.—The mountainous nature of the lands, and the great difficulty of reaching a market, has heretofore prevented any extensive system of agricultural pursuits to be inaugurated in this county. Corn

and wheat have been the chief staples, though rye, oats, barley, and the hay grasses all grow well. Live stock run loose in the range. Only the scrub breeds are known, but these have been produced in quantities sufficient for home use, and some for export, which consist usually of mules, hogs, and sheep. Those sent from the county are either driven South or else sold to the adjacent counties in Kentucky and Tennessee. The mast of oak acorns and nuts is generally sufficient to feed the hogs during the fall and winter months, and sheep do well on the mountain grasses and the bitter shrubs of the ridges. This industry (sheep-raising) might be made exceedingly profitable if good breeds were introduced, and proper care given to them. Fruits of all kind do as well here as in any part of the State, and now that the Cincinnati Southern Railroad is about completed to the county, nothing could be made pay better than orchards and vineyards, coupled with wine and brandy-making.

Education and Religion.—The free common public schools are the only ones now taught in the county, and these are to be found in every district. The Hard-shell Baptist, Methodist, Reformer, Presbyterian and Missionary Baptist are the chief Christians in the county. The churches or meeting-houses are generally plain log or frame houses, well suited for the uses intended by the good, pious, intelligent members who worship therein.

Remarks.—The citizens of Whitley are exceedingly generous and hospitable, and having no great desire for accumulating large fortunes, they take many of the pleasures of life as they pass through it. They have the most good fishing streams of any county in the State, and they enjoy the sport of the rod, the seine, and the gig, equal to Izaak Walton himself. They also have game of all kinds in abundance, and they love to hunt it with dogs and gun. They are by no means a selfish people; so whenever a neighbor has a house to build, corn to husk, wheat to cut, logs to roll, or the ladies a quilt to make, or a wedding to be consummated, every one cheerfully goes over and lends a helping hand, and then follows a frolic and a dance, which sometimes lasts for several days. Everybody endeavors to make everybody else happy, and all go home well pleased and satisfied.

Domestic Arts.—Nearly all the cloth used for every-day wear is made at home by the women on the spinning-wheel and hand-loom. If they have any surplus, it is traded to the merchants of the country. A considerable traffic is also carried on in eggs, poultry, feathers, beeswax,

ginseng, maple sugar, tree molasses, furs, peltries, and fox and wolf scalps, from which sources quite an income is every year brought into the county. There is room for large fortunes to be made in this county when the minerals are fully developed.

WOLFE COUNTY.

In the year 1860 this county was formed from parts of Breathitt, Morgan, Owsley, and Powell, and named for Nathaniel Wolfe. It is bounded on the north by Menifee and Morgan, east by Morgan, south by Breathitt and Lee, and west by Powell county.

Timber, Streams, and Topography.—Wolfe county is located near the centre of the eastern part of the State, on the waters of Red river, which flow from east to west through the northern half of the county. The North Fork of the Kentucky river, which affords water enough for slack-water navigation, forms the southern boundary. The tributaries of these rivers are Gilmore, Stillwater, Swift, Parched Corn, Wolf Pen, Lower Devil, Upper Devil, Holly, Gilladie, and Frozen creeks. Several of these have good fall, and supply sufficient water for saw and grist-mills. The original forests of Wolfe were equal to any in the State for the size and value of their useful timbers. More than 75 per cent. of these forests are still in their primitive condition. .

Geology and Soil.—The entire county is based upon the true coal measures of the Eastern Kentucky coal field. The coal strata begin with the sub-conglomerate, similar to those of Whitley and Knox counties, and, after passing the mill-grit, are again found in beds corresponding to those of Carter, Elliott, and Morgan. The county is one of the smallest in the State, and yet the amount of coal and iron ores within its borders is practically inexhaustible. These coal and iron ores outcrop along all the rivers, creeks, and ravines, and are quite easy to mine. The surface of the country is level along the river bottoms, and in various small tracts scattered on the ridges, but elsewhere is hilly and broken. The soils of the bottom lands are exceedingly rich and fertile, but on the ridges the lands are thin, and frequently rocky. As a gen-

eral rule, the soil derived from the coal measures of the eastern coal field can by no means be regarded as an unproductive soil, yet the limited amount of level arable land must necessarily restrict the agricultural pursuits of the people inhabiting these mountain counties; hence the development of their coal and mineral resources becomes a matter of the first importance to them. There can be but little doubt, from the reconnoissance made by the two Geological Surveys of the State, that these resources in coal and iron—staple commodities of every nation of great prosperity—will, when fully developed, compare most favorably with those of any civilized country upon the earth's surface. These vast amounts of mineral wealth lie thickly strewn over a territory as large as is the area of some of the independent nations of Europe.

Agriculture.—There has never been in Wolfe such an extensive system of agricultural pursuits as is to be found in many other counties, owing to the want of facilities for freight and travel; yet the energetic citizens have always produced enough corn, wheat, oats, rye, and potatoes to supply their wants, and a small surplus for export. They have never planted tobacco, except in small patches, although the soil is well adapted to its growth. Blue-grass grows fair in the county, and the hay grass—timothy, herds-grass, orchard-grass, clover, millet, and Hungarian grasses—yield most elegant crops. Live stock of all kinds, particularly hogs, sheep, and mules, do well. The oak and nut mast is sufficient generally to keep hogs through the winter; and sheep do as well here on the native hill grasses and shrubs as in any part of the State. Wool-growing would pay largely with the improved breeds of Cottswold, Merino, or Shropshiredown sheep. Bees do well, and honey is abundant in the hollow trees of the woods.

Domestic Arts.—The old habits of spinning and weaving are kept up by the energetic, industrious, intelligent women (who are here, as elsewhere, the salt of the earth). They make all the cloth needed for common family wear, and much for traffic to the country merchants. They also trade with these merchants largely in eggs, butter, poultry, dried fruit, home-made socks, ginseng, beeswax, home-made sugar, and molasses. With these articles they make enough to supply the wants of the family, and to keep themselves dressed in the latest styles of hoop-skirts, pin-backs, and fashionable bonnets. There are no large factories in the county, but numerous grist and saw-mills, tanneries, and mechanic shops sufficient to supply the wants of the people.

TOWNS AND VILLAGES.

The county seat is *Campton*, a beautiful town of some 150 inhabitants, pleasantly located on the east side of Swift creek. It has, besides the usual public buildings, two churches, a grist and saw-mill, an academy, a tannery, four mechanic shops, and several neat, comfortable private residences.

Hazelgreen, on the eastern side of the county, is a neat village of about 100 inhabitants, with a considerable local trade.

Stillwater, 7 miles east of the county seat, is a new, flourishing village.

Education and Religion.—There is an academy at Campton and a good high school at Hazelgreen. The only other schools are those taught under the common school laws of the State. These schools are now taught five months in the year in nearly every district. The Hard-shell Baptist, the Methodist, Reformer, Free-will Baptist, and Presbyterian are the chief Christian denominations. The meeting-houses or churches are plain log or frame structures, well suited to the wants of the good, working, moral congregations who worship therein on nearly every Sabbath.

General Remarks.—The people of Wolfe are not savage like the name of their county, but, on the contrary, are intelligent, kind, industrious, and exceedingly hospitable. They are sufficiently native-born philosophers not to spend all their lives in the vain search for the almighty dollar; but as they pass through life they attempt to enjoy some of its pleasures. Having good streams, they fish; having plenty of game, they hunt with dogs; having firm, elastic, sinewy muscles, they dance at their frolics, quilting parties, and weddings; having plenty of rich food, they live high; and having no debts, they never growl or complain of hard times. Truly, this is a delightful country in which to live, and a good place to preserve a man's equanimity of temper throughout a long lifetime. If the people had more enterprise, they would become richer, but it is exceedingly doubtful whether they would be any happier, or any better men or women. Such counties as Wolfe are fortunately the fountain source of our growing population, and from this stock comes the rich blood coursing through the veins of healthy women, which is destined to keep the effeminate city people from dying out. These mountain counties are the nurseries of our city populations, from which healthy people come to replenish. So mote it be.

WOODFORD COUNTY.

Woodford, alphabetically the last county, but in average good and rich lands probably the first, was formed in 1788 by the Legislature of Virginia (being the last formed by her), from a part of Fayette, and named in honor of Gen. Wm. Woodford. It is bounded on the north by Franklin and Scott, east by Fayette and Jessamine, south by Jessamine, Mercer, and Anderson, and west by Mercer, Anderson, and Franklin counties.

Topography, Geology, and Soil.—This county lies in the centre of the "Blue Grass Region of Kentucky," and is, in all probability, as favorably located as regards climate, soil, and facilities for easy communication with the balance of the Western country, as any section of the Ohio Valley. It is based entirely upon the upper Cambrian or lower Silurian rocks, and has no coal, iron, or other valuable minerals, if we except small veins (not sufficient for profitable working) of lead ore and sulphurets of barytes, which are found in connection with the strata of the "birds-eye" limestones. The face of the country is level or gently rolling, except immediately upon the bluffs of the rivers or creeks. The soil is very rich and fertile, and is peculiarly adapted to the growth of blue-grass, hemp, and corn. It has been formed from those strata of the lower Silurian blue limestones and marls, which are richest in fossils containing lime, phosphoric acid, sulphuric acid, and the alkalies. It contains often ten times as much lime, three to four times as much phosphoric acid, two to three times as much sulphuric acid, and double as much potash, as a majority of the lands of the Western country. Its red subsoil or clay also contains a much larger quantity of alumina and oxide of iron than is to be found in any other soils, except the red clay of the sub-carboniferous formations, or of some particular strata of the true coal measures. As before stated, these Woodford county lands are peculiarly well suited for hemp culture, and on some farms this staple has been cultivated for over half a century almost without interruption, and still the lands show little or no depreciation in fertility. The soil derived from the debris or rotting of the blue limestone and marls of the lower Silurian date appears to be specially genial to the growth of blue-grass, as is evidenced from the superior stock farms throughout

Central Kentucky. The cattle, horses, or sheep reared on this grass take on a peculiarly solid bone and muscle unknown elsewhere; so much so that a steer or horse raised on these soils will advance in bulk, form, and weight almost, if not quite, one year in four, when compared with similar stock from the gray limestone or Carboniferous Group. The corn and small grain, like the live stock, is more solid, and, by experiments, contain five per cent. more carbon or alcohol in the manufacture of whisky. By a comparison of the soil of the blue limestone of Woodford with the soil overlying the magnesian limestone that underlie the coralline beds of the Falls of the Ohio river, in Jefferson, made by Dr. Peter, the chemist of the Geological Survey under Dr. D. D. Owen, it was found that, "the quantity of inorganic fertilizers which the Woodford county soil possesses over the Jefferson county soil, in one hundred parts, are—

Alumina and oxide of iron and manganese.	5.481
Carbonate of lime.	2.070
Phosphoric acid	0.114
Sulphuric acid	0.068
Potash	0.194
Soda	0.087
Total.	8.014

"The total preponderance of these fertilizers is, therefore, over 8 per cent.

"Assuming, as found by trial, that the average approximate weight of these air-dried soils to be sixty pounds to the square cubic foot, we obtain the following amounts in pounds on each six inches deep, which the blue limestone soil of Woodford county contains over that in the soil of the eastern part of Jefferson county:

71,628	pounds of alumina, oxide of iron, and manganese.
27,050	" carbonate of lime.
1,489	" phosphoric acid.
388	" sulphuric acid.
2,535	" potash.
1,136	" soda.
104,723	pounds total.

"Hence, to make the Jefferson county soil equally productive with the Woodford, for six inches in depth, there requires to be added to each acre of ground:

71,625	pounds of ferruginous clay.
27,050	“ limestone, or 16,168 pounds of burnt lime.
3,175	“ bone earth.
2,161	“ gypsum.
4,848	“ unleached ashes.
2,455	“ common salt.

111,314 pounds total.

“In place of the 3,175 pounds of bone earth and 2,161 pounds of gypsum there might be substituted 3,000 pounds of superphosphate of lime: that is, bone earth that has been treated with sulphuric acid, by which results an acid phosphate of lime and gypsum, which has been found, in practice, an excellent form of application of the highly important inorganic constituents of soils. Soda and lime are also very advantageously employed in agriculture by dissolving common salt in as much water as is required to convert the caustic lime into a fine powder, and slaking the lime with this brine.”

I quote this comparison of soils to show the great richness of the blue-grass lands, and also to show the importance to farmers of their knowing the elements contained in the soils they cultivate. Underlying the black, friable, rich top soil in Woodford is a deep red or chocolate-colored subsoil or clay, more rich than the top soil in the oxide of iron and alumina, which is a perpetual feeder (when the top soil becomes exhausted or tired) of plant food, provided the farmer will plow deep or subsoil his farm. Hence, a first-class Woodford county farm will keep rich for a thousand years if green crops are occasionally plowed under, and subsoiling is practiced, although sometimes there may be need of gypsum, salt, and bone-dust in small quantities.

Agriculture.—Such soil as we have just described always insures the best and most prosperous class of agriculture. Hemp, wheat, corn, oats, barley, potatoes, rye, and the hay grasses all grow to perfection, and rarely fail of a full crop. It is nothing uncommon for corn to yield 75 to 80 bushels to the acre. In live stock, Woodford ranks A No. 1. No part of this country, England, or Europe can beat it in horses, cattle, sheep, hogs, or poultry. Such public-spirited, wide-awake men as Col. Abram Buford, Col. James E. Blackburn, John Alexander, Samuel Wooldridge, B. Gratz, Frank Harper, the Messrs. Crutcher, and others, have stock and grain farms upon these blue-grass lands, which are almost national in their reputation. These, and such far-seeing men as they, keep the country well supplied with the best pedigrees of stock of every class known to the world. In fruit culture this county equals any in

the State. Apples, pears, peaches, plums, cherries, apricots, nectarines, and all the smaller fruits and berries, grow to perfection. Vineyards, so far as they have been tried, do well, and no doubt the improved native vines, if properly cared for, could be rendered profitable for wine and brandy-making. One strange thing is, that, with the best cattle and the richest milk and the heaviest corn and the most luxuriant blue-brass on the continent, Central Kentucky has no large co-operative dairies for making cheese and butter, as they have in New York or Ohio. (See article on Dairying.)

TOWNS AND VILLAGES.

Versailles, the seat of justice, is one of the most beautiful towns in the United States. It is located near the centre of the county, upon an elevated plateau, surrounded by an exceedingly fertile country. A large cave spring issues from the rocks, about one hundred yards from the court-house, and flows off in a stream large enough to turn a mill. Besides the usual public buildings, Versailles contains six churches, two banks, two academies, grist and saw-mills, tannery, wool-carding factory, twenty mechanic shops, and numerous elegant private residences; population about 2,000.

Midway is a neat, handsome town of 700 inhabitants. It is situated on the Louisville and Lexington Railroad, fourteen miles from Lexington, and nine miles from Versailles.

Mortonsville, five miles south of the county seat, is a place of considerable trade; population about 300.

Clifton, on the Kentucky river, has 150 inhabitants, and is a considerable shipping point.

Troy is a flourishing town of 100 inhabitants, and *Millville* of 75, each doing a prosperous local trade.

Ducker and *Spring Station* are points on the railroad, which do each a large shipping business, and the local trade for very rich neighborhoods.

Streams, Timber, and Railroads.—The Kentucky river forms the entire south and western boundary of this county, and South Elkhorn a part of the eastern and northern boundary. The other streams, some of which afford good mill-sites, are Glenn's, Clear, Holman's, and Tanner's creeks. Originally the timber of Woodford was very heavy, and the forests extensive. The principal growth was blue ash, walnut, black ash, locust, hickory, hackberry, sugar-tree, &c., &c., with an undergrowth of sassafras, papaw, pea-vines, grape-vines, cane, &c. The Louisville

Cincinnati, and Lexington Railroad runs through the northern part, and the Cincinnati Southern nearly touches the southern part of the county. The common roads of the county are all well macadamized.

Education and Religion.—Versailles Academy is a first-class institution, under the able management of Prof. Wm. Henry and several assistants. Midway Academy is another institution of high repute, under charge of Prof. Wm. Moore. The Christian Church has a noble charity school for orphans at Midway. There are several other private high schools in the county, beside the free common schools taught in every district under the State system. No county in the State has better educational facilities than Woodford, or has a population that more highly appreciates the necessity of general education. The Baptist, Episcopalian, Reformer, Presbyterian, Catholic, and Methodist, are the principal Christian denominations. The church buildings throughout the county are elegant structures that reflect credit upon the tastes of the pious, devoted, working members who worship therein. A more sensible, moral, and upright community than the citizens of Woodford cannot be found in any county, either in America or Europe.

General Remarks.—With Woodford, we close the list of counties in Kentucky, almost with the idea of the verification of the old adage, that, "the best shall be last;" but this we will not say, for Kentucky abounds, in every part of her territory, with rich soils, heavy forests, immense coal fields, unlimited beds of iron ores, great savannahs of fertile, widespread tobacco lands, and boundless products for the use of factories and large cities. Who, then, can say which county is best?

FENCING OF LANDS—ITS COST.

The vast amount of labor and expense every year that is expended in keeping the farms of Kentucky fenced, and thereby preserving the growing crops from the depredation of live stock, have never been duly appreciated by the citizens of the State. In this country the old "worm fences" still hold preponderance, although in sections there are many stone fences, and some of posts and planks. Without any specific and accurate information, giving the length and cost of fences surrounding the plantations, farms, orchards, and gardens, and dividing them into fields and lots, we can only make a reasonable approximation to both by properly using the statistics we have. There are in Kentucky (in round numbers) 125,000 farms, which will average about 600 rods of fencing to the farm. This will aggregate 75,000,000 rods, or 150,000,000 of single pannels of worm fencing. To build this amount of fencing will take nearly 2,000,000,000 split rails, and not less than about 70,000,000 of good rail trees. To keep this immense amount of fencing in annual repair would require a yearly consumption of 280,000,000 of rails, and the destruction of not less than 10,000,000 of timber trees. The money cost, or the value in labor, of this enormous quantity of fencing, is not less than \$75,000,000, and the annual cost of keeping it in repairs is not less than \$10,000,000 in the entire State. The census reports of 1870 make the value of farms in Kentucky \$311,238,916. Now take the value of fences at \$75,000,000 (which is rather under than over), it takes nearly one fourth of the value of the farms to fence them and to keep up the fences. By the same census reports we find the entire agricultural products and betterments per annum are estimated at \$87,477,374; the cost of keeping up the fences is \$10,000,000, or about 8 $\frac{7}{8}$ per cent. of this amount. The live stock, which the fences are intended to restrain, are worth to the State each year \$24,121,861, while the restraining fences cost \$10,000,000, or largely more than one third of the value of the stock. From these figures all farmers may learn that fences are an expensive luxury, and it would be well to contrive some plan by which their great cost might be removed from the farmer's slender income. How this can be done is a question fraught with many difficulties. Stone, hedges, briers, stakes, boards, planks, wire, and all

the "patent contrivances" for fencing, are probably less suited, and more expensive and costly to the average Kentucky farmer, than split rails.

We build fences for two objects—first, to keep cattle and other live stock in; secondly, to keep them out. Their sole use is to keep the farm stock of neighbors from depredating upon the crops of each other. There are two ways in which this can be done without such an immense outlay of labor and capital each year, both of which are practiced in all the older countries of Asia and Europe, where timber has become too valuable to be used for fencing purposes. One way is to confine all farm stock to the stable and stable-yard, and transport their feed from the place of production to them; the other is to accompany the herds with a herdsman when out to pasture, or else to have movable fences easily taken down and put up, which can be quickly and cheaply placed around the grazing pastures. The solution of this question, how to reduce the cost of fencing, involves a very wide range for investigation, which should be carefully studied by our farmers, and those to whom they intrust the law-making powers of our State. Laws should be passed amendatory to the fence laws at present in force throughout the Commonwealth. These laws should localize their action, and give relief to those counties wherein timber is most scarce, and lands are most valuable for cropping purposes. In all such localities a vast saving could be effected to the farmers each year, if the laws could force every owner of live stock to keep them within their own farms, upon the old German idea, "whatever stock I have fenced in is mine, but what is not fenced belongs to the public." Then let it be lawful to have all cultivated fields without inclosures, and make every man responsible for the damage done by his cattle upon his neighbor's crops. This is the common rule throughout large portions of Europe, Asia, and in Japan, where the most skillful farming in the world is practiced. Something must be done on this head for our farmers, and the sooner it is done the better.

HOG CHOLERA—ANIMAL PARASITES.

Probably no one scourge entails upon the people of Kentucky so large a pecuniary loss each year as the disease, or complication of diseases, known as hog cholera. The great prevalence of this scourge began in the United States about the year 1856. Many old farmers think that it was introduced into this country from Asia, and that there is a close connection between this disease and chicken cholera, which also, about the year 1856, began to spread throughout the States. The more recent investigations with the microscope seem to confirm these ideas, and to induce a belief in the theory that both chicken and hog cholera is caused from the deposit of myriads of microscopic animalcules, or microscopic insects (possibly the same with both hogs and fowls), upon some vital organ in the system of the animal. Several very highly educated physicians have been for months engaged in making microscopic examinations upon the blood of hogs and fowls affected with the disease, or which have died from it. They have found, almost universally, that there are extremely minute insects or animalcules in the blood, in countless numbers, which have pierced the globules of the blood in such manner as to allow the serum to ooze through the perforations. In some cases the lesion will be in the lungs, indicating that the parasites have been inhaled into the system from the atmosphere; in other cases the lesion would be in the stomach and intestines, indicating that the parasites were eaten with the food; sometimes they were found in the brain, as if they came through the nostrils, and then in the liver, as if they passed from the stomach through the secretions to that organ.

These investigations give some grounds for the general idea among many farmers, that this disease was brought to the United States through the introduction of the Shanghai and Bramah chickens, and that the identical microscopic animalcule afflicts the hog and fowl.

I am inclined to the opinion that the true cause of the disease is a microscopic parasite, and that further investigations will eventually establish this theory. From a large number of letters regarding this disease, its cure and prevention, I find that the remedies recommended are nearly always insecticides, or such as are destructive to insect life, such, for instance, as sulphur, coal oil, coal cinders, carbolic acid, tur-

pentine, rosin, asafoetida, tobacco, poke-root, henbane, tan-ooze, copperas, mercurial ointment, calomel, Crab Orchard salts, etc., &c.

Ex-Governor Jacob, of Oldham county, and several other farmers of high standing and intelligence, write me that if hogs are allowed free access to banks of stone coal cinders they will eat them freely, and will never have any symptoms of cholera. Others recommend sulphur and coal oil given with mush or upon ears of corn. Mr. Thos. C. White, Col. Isaac Shelby, and other good stock men about Danville, say that they have found Crab Orchard salts an excellent preventative, while different persons have recommended all the articles above mentioned.

The medical profession at this time is making many new discoveries regarding diseases (to which the human family is subject) through means of powerful microscopes, and have pretty well established the fact that typhoid fevers, croup, most eruptive diseases, and many of an inflammatory nature (probably Asiatic cholera included), are caused from minute animal or vegetable parasites. Possibly parasites of infinitesimal small proportions may be the cause of malaria in the swamps and low lands of our country, and are the cause of the malarial diseases of those regions.

If this "animalcule theory" of hog and chicken cholera is correct the farmer should be careful to remove every animal as soon as it is affected, and if it cannot be easily cured it should be killed, and the body burnt or buried, so as to destroy the insects before they pass from the bowels, or by decay of the carcass, into the atmosphere; and in this way he may destroy the contagious effect in the neighborhood. This is a most interesting and important subject for the farmers of Kentucky, and I hope that this short chapter may be suggestive to men of science and practical stock-raisers of the necessity for making such a series of experiments as may result in the discovery of a perfect panacea for this terrible scourge.

ORCHARDS.

Apples, Peaches, and Other Fruits.—In planting orchards great pains should be taken to have the ground well drained and deeply broken before the trees are planted. Fruit trees cannot flourish on wet, swampy lands, nor where a stiff yellow clay, which holds water, prevails. Hill-sides are good for orchards when there is not too great a tendency to washing into gullies. Any land with a strong dry soil, and moderately moist, will do for an orchard; even a wet, hard-pan subsoil will do, provided it is well under-drained with tiles; for, as a general rule, fruit trees will grow well wherever corn flourishes. Having selected your orchard spot, the next thing is to break up and subsoil the whole, or at least the space where the trees are to be set, for a space of not less than eight feet. This is to keep water from settling in after years around the roots of the trees, which it will certainly do if a two or four feet square hole is dug for the tree. Now lay off your rows (perfectly north and south) at a proper distance (for apples from 35 to 40 feet, and for peaches half the distance), and set the young trees as nearly as possible in the position they stood in the nursery; that is, with the same side of the tree to the north. The best time for planting is in the early spring (February, March, and April), or in October and November in the fall. I much prefer planting all fruit trees in the spring. Select trees of thoroughly ripened wood. Prune severely, to balance the loss of roots, cutting back the wood on each branch at least one half of the last year's growth of wood. Carefully spread the roots out horizontally (cutting off all that are broken or bruised), and fill around them with well pulverized rich earth for two feet in each direction, inclining the roots slightly downwards. Tread the soil gently down with the foot around the tree when the hole is entirely filled with earth. In case the land is poor, a compost of well-rotted barn-yard manure, mixed with ashes and virgin soil, can be used to great advantage in filling the holes, even to the distance of from two to four feet around the tree. Iron cinders scattered around pear and peach trees always improve the bearing and the quality of the fruit.

The pruning of apple trees can be done at any time when the sap is dormant, and should begin when the tree is taken from the nursery. No other instrument is needed for this purpose than a common pocket-

knife, or pruning-knife with a hooked blade. No invariable rules for pruning can be laid down, since different kinds of trees naturally form different heads; yet we learn to remove all limbs which cross or interfere with each other, or are so near above each other that, if loaded with fruit or leaves, will rest on or chafe the one below. Limbs should be removed where they are so thick as to exclude the air or light. The first set of limbs should be at right-angles with the trunk, and radiate from it like the spokes of a wheel. The next set should not be directly over these, but alternating with them, so that, if loaded with fruit, each upper branch will rest upon two limbs, and not seriously interfere with any one below, as would be the case if directly above. The lowest limbs should not be higher than from five to six feet above the ground. In pruning, have in view always these three objects: first, larger fruit; second, plenty of sunlight and air; third, greater convenience in gathering the fruit.

Harvesting.—All kinds of fruit should be picked from the trees by hand. If winter apples, they may be kept in open barrels or bins in the barn or sheds until there is danger of freezing, then barreled up and kept in a dry, cold cellar, or some other place as cold as can be done without freezing.

Cultivation.—It is best to cultivate orchard lands in small grain or clover, but not to exhaust the soil. The cultivation of orchards is often carried to extremes, doing more injury than good. The land should not be plowed and cropped without manuring the trees, from year to year, so as to destroy the roots as fast as they attempt to extend themselves, in order to perform their office; but let the cultivation be just sufficient to keep the ground in good condition, and to kill out unnecessary weeds and brambles. After the orchard comes to bearing it may be sown in grass and pastured to great advantage by hogs and sheep or young cattle. The best fertilizers are wood ashes, tobacco stalks, leaves, and well-rotted barn-yard manure. Spread the fertilizers around the trees as far as the branches extend.

Apples.—This fruit is a native of both the Eastern and Western Continents, and originates from the great varieties of the crab found growing wild in either hemisphere. The improvements have been made by judicious cultivation and a system of crossing. Thus, by mixing the pollen from the stamen of one variety with the pistil of another blossom, a mongrel apple is produced, and from the seed of this fertilized fruit new varieties come. Over fifteen hundred varieties of apples have in

this way been brought into notice in this country and England. Most varieties of apples flourish best near the locality where they originated. Grafting and budding are the usual plans whereby a select variety is propagated.

Why Apples, Grapes, and Pears Deteriorate.—The budding and grafting process, while they retain the select variety, tend greatly to destroy the hardihood and vital energy of the plant. When the bud or graft is taken from near the extremity of the limbs or twigs, or at a distance from the main trunk and root of the apple trees or of grape-vines, it carries with it an enfeebled circulation, such as exists in all unmaturing or soft parts of a tree or vine; where this is continued for many generations, the vitality becomes eventually so greatly impaired that parasites of all kinds seek the weakened plants for their food. It is from this source that originate most of the blights to apples, pears, grapes, and other fruits. It is similar to breeding by a diseased parent in live stock, or a consumptive man among the human family. The law is the same, and the result similar. It is from this cause, evidently, that the Catawba grape in this country has deteriorated, and from this may come the reason why the French nation every year is threatened with an entire loss of crops from their old standard vines, and are forced to import new seedling stocks, more nearly related to the wild native vines, from America and elsewhere. It is for this same reason that our wild grapes, plums, crab apples, wild cherries, and seedling peaches and apples, bear the late spring frosts so much better than do the less hardy trees and vines grown from budded and grafted stocks. The remedy, then, against parasites, blight, and deterioration, is a return, as nearly as can be, to the hardy native wild seedlings, and when we do graft or bud, to use only such buds or scions as may come from near the main heart and tap root of the original plant.

Caterpillars and Curculio.—The best plan to get rid of these pests is to burn them in their beds, with a rag saturated in coal oil, and also to keep hogs always in the orchards to eat all the unripe fruit that falls from the trees. Ashes and lime scattered under the trees will likewise prove beneficial.

Mixed Orchards.—For family use it is probably best to have the orchards to consist of mixed fruits, say that the apple trees are planted at from 40 to 45 feet apart, with peaches, nectarines, apricots, cherries, and plums intermediately between the rows. By this plan there will be a greater use made of the lands, and the apples will not be at all incon-

venieniced by the other fruits. Through the kindness of Mr. James Duncan, an excellent nurseryman and old fruit-raiser in Jefferson county, near Louisville, and Mr. Hite, also of Jefferson, and of several correspondents from different parts of the State, I am enabled to give lists of the best varieties of the different fruits adapted to the soils and climate of Kentucky.

A LIST OF FIFTY APPLES FOR FAMILY USE.

SUMMER.

Chenango	2	Summer Pearmain	2
Early Harvest	2	Sweet Bough	2

FALL.

Fall Pippin	2	Munson's Sweet	2
Fall Queen	2	Porter	2
Maiden's Blush	2	Rambo	2

WINTER.

Ben Davis (N. Y. Pippin),	2	Pryor's Red	2
Lansinberg	5	Rawle's Janet	3
Limber Twig	2	Red Winter Sweet	2
Milam	2	Wine Sap	5
Newtown Pippin	2	Yellow Bellflower	2

A LIST OF ONE HUNDRED APPLES FOR MARKET USE.

SUMMER.

Early Harvest	10	Chenango Strawberry	10
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FALL.

Fall Queen	10	Porter	8
Maiden's Blush	10	Rambo	2

WINTER.

Ben Davis (N. Y. Pippin),	25	Rawle's Janet	10
Lansinberg	5	Wine Sap	10

A GENERAL LIST OF APPLES ADAPTED TO OUR SOIL AND CLIMATE.

Those marked with one * are extra, and those with two ** are double extra fine, as proven by trial in many Kentucky orchards.

SUMMER APPLES.

** *Chenango Strawberry*. Red stripe, on yellow ground.

** *Early Harvest*. Medium size, pale yellow, flesh tender, juicy, acid, good; tree a slow grower. July.

* *Golden Sweeting*. Medium, rich, sweet, productive, good for baking and for stock.

* *Red Astrachan*. Large, beautiful, red, highly valuable for market and cooking.

** *Sweet Bough*. Large, fine, yellow, rich, tender, and very sweet.

* *Summer Queen*. Large, fine, striped, sprightly acid flavor, excellent.

* *Summer Pearmain*. Medium, striped, spicy, sub-acid, very good.

FALL APPLES.

- * *Fall Pippin, or Golden Pippin.* Large, yellow, rich, sub-acid, much esteemed.
- ** *Fall Queen.* Large, striped; good for market and drying.
- * *Gravenstein.* Large, handsome, striped, sub-acid, first quality.
- ** *Maiden's Blush.* Medium, light yellow, with a blush; fine for market.
- * *Munson Sweet (Orange Sweet).* Large, round, golden yellow; sweet, fine flavored; productive. August.
- ** *Porter.* Large, oblong, yellow; flesh tender and excellent.
- * *Rambo.* Well known and highly approved throughout the West.

WINTER APPLES.

- ** *Ben Davis (New York Pippin).* Bright reddish crimson on yellowish ground, striped with dark crimson; flesh white, rather coarse, mild flavor.
- * *Bellflower Yellow.* Large, long, yellow, with a tinge of red; sprightly sub-acid, excellent; best on warm, rich soils. December.
- ** *Heve's Virginia Crab.* Small, dull red, unsurpassed for cider; tree very slow grower, but prodigious bearer.
- * *Hubbardston Nonsuch.* Large, striped, yellow, and red; flesh yellow, juicy, and good.
- * *Jonathan.* Medium, roundish, ovate, brilliant red, very handsome and good; tree a good bearer but poor grower.
- * *Journalaska.* Southern; recommended as a long keeper.
- ** *Lansinberg.* It promises well as a long keeper; over medium in size; beautiful blush on yellow ground, fine flavor, early bearer, and the tree a good grower.
- * *Limber Twig (James River).* Medium or large, greenish with dull stripes; flesh firm, rather coarse; valued at the South and West; long keeper.
- * *Milam.* Medium; roundish conical; flesh firm, juicy, pleasant flavor; tree hardy, very productive. December.
- * *Newtown Pippin.* Well known, and highly approved where it succeeds, but often fails at the West and South; tree requires high culture.
- * *Pryor's Red.* Southern; medium, roundish, color variable, greenish yellow, shaded and striped with red, and more or less russet; flesh yellowish, tender, juicy, rich; tree a poor grower, leaves apt to rust. January to March.
- ** *Rawle's Janet (Gencting of Ky.; Never Fail).* Medium, roundish, ovate, greenish yellow, striped with pale red; flesh very crisp, rich, and juicy; highly esteemed in Kentucky and the Southwest; small, North.
- ** *Red Crab.* Southern Kentucky.
- * *Romanite (Gilpin).* Deep red; flesh very firm, crisp, juicy, with mild, pleasant flavor; only valued as a late keeper.
- * *Red Winter Sweet.* Sugar-loaf shaped; size medium; productive and good. Southern. Season, December to January.
- * *Red Crab.* Cider; esteemed in Southern Kentucky.
- * *Shockley.* Medium, yellow, with crimson cheek; much esteemed South as a late keeper. Southern.
- ** *Wine Sap.* Rather small, deep red; flesh yellow, firm, rich, juicy; fine for table and for cider; highly productive, but slow growth. January to April.
- * *Winter Pennock (Large Romanite).* Large, roundish, oblique, red striped, with large gray dots; flesh yellowish, firm, juicy, and coarse; but keeps well, and esteemed by some for market.

APPLES FOR ORNAMENT AND PRESERVING.

* *Hyslop Crab*.

** *Transcendent Crab*. Similar to last named in size, red, very showy and handsome; excellent.

Peaches.—Next to apples the peach is the fruit of the people. It originated in Persia, and is by nature semi-tropical, yet it grows to perfection in all parts of Kentucky. It can be easily cultivated in the open orchards, and does well to alternate on the land with the apple or other fruit trees. It is said to be derived by cultivation and improvement of the bitter almond, which it resembles in its woody fibres, leaves, and blossoms.

A LIST OF FIFTY PEACHES FOR FAMILY USE.

Cooledge's Favorite.	5	Oldmixon's Free	5
Crawford's Early	5	Smock's Free.	5
Catharine Cling.	5	Troth's Early Red	5
Early Beatrice	5	Ward's Late	5
Hopkinsville (Bryan's), (or Rodman's Cling)	5	White Heath	5

A LIST OF ONE HUNDRED PEACHES FOR MARKET USE.

Crawford's Early	10	Rodman's Cling.	10
Early Beatrice	10	Smock's Free.	10
Hopkinsville	5	Troth's Early Red	10
Mixon's Free.	10	Ward's Late	10
LaGrange	5	White Heath.	20

A GENERAL LIST OF PEACHES ADAPTED TO KENTUCKY.

* *Alexander*. Hardy, productive, juicy, and delicious.

* *Cooledge's Favorite*. One of the best early; white, mottled with red; flesh pale, juicy, and delicious; medium size; tree very hardy, productive.

* *Crawford's Early*. Very large and beautiful, yellow and red; well known; best for market; tree vigorous and productive.

* *Catharine Cling*. Nearly identical with *Mixon Cling*.

* *Druid Hill*. Large, greenish white, very juicy and rich.

** *Early Beatrice*. Ten days before *Haines Early*; white, flesh red; not subject to rot; hardy, productive, large bloom.

* *Early Rivers*. Juicy, productive, and profitable.

* *Early York (Serrate)*. Medium, greenish white, dull red in the sun; very juicy and fine flavor; early.

* *Early Tillotson*. Medium, white and red (resembling *Early York*, but earlier), one of the best; tree liable to mildew in some localities. Best in South.

* *George The Fourth*. Large, round, yellowish white, with red cheek; very juicy and rich; much esteemed; moderate bearer.

** *Haines Early*. Large, white, with red cheek, juicy and delicious; very productive and profitable.

* *Heath Free (White Melocoton)*. Large, creamy white, with red cheek; excellent; esteemed for preserving.

** *Heath Cling*. Large, late, white, red cheek in the sun; keeps a long time; very beautiful, and fine for marketing and preserving.

** *Hopkinsville (Bryan's)*. Rich, juicy, delicious. Favorite in Southern Kentucky.

** *Large Early York*. Large, white, with red cheek, very juicy and delicious. August.

* *LaGrange*. Large, late, greenish white, juicy, sweet, and rich. October.

* *Morris White*. Medium, white, red in the sun; excellent for preserving, etc.

** *Oldmixon Free*. Large, greenish white, red cheek; very juicy and delicious; resembles the *LaGrange*, but larger and earlier.

* *Oldmixon Cling*. Large, white, red in the sun, juicy and good; best of clings.

** *Rodman's Cling*. Large, mostly red; profitable; late.

** *Smock Free*. Large, yellow; late; Southern.

** *Tippecanoe Cling*. Large, yellow and red; excellent; late. 1st October.

** *Troth's Early Red*. Very early, dull green and red, juicy, good flavor, great bearer; profitable for market.

** *Ward's Late Free*. White and red, fine; highly esteemed.

A GENERAL LIST OF CHERRIES SUITED TO OUR SOIL AND CLIMATE.

HEART AND BIGARREAU CHERRIES.

** *Black Tartarian*. Very large, excellent, and productive. 20th June.

** *Gov. Wood*. Large, beautiful, yellow and red; best of Dr. K.'s. Middle June.

* *Kirtland's Mary*. Large, bright red, handsome and fine. 1st July.

* *Napoleon Bigarreau*. Large and beautiful, yellow and red, good. 1st July.

** *Yellow Spanish*. Whitish yellow and red, juicy, rich, and excellent. Last June.

DUKE AND MORELLO CHERRIES.

* *Belle Magnifique*. Large, bright red, juicy, sprightly, sub-acid, good. July.

* *Carnation*. Large, mottled, bright red, juicy, sub-acid, sprightly flavor. July.

** *Early Richmond (Early May of some)*. Very early, medium, red, sour; good when ripe; very hardy, profitable, and productive. 1st to 10th June.

* *Late Duke*. Large, mottled with red, sub-acid, resembling *May Duke*, but ten days later.

** *May Duke*. Well known, dark red, sub-acid, juicy, productive and valuable. 1st June; continues ripening for two weeks.

* *Reine Hortense*. New, large, fine, red, sprightly sub-acid, excellent. July.

** *Black Morello*. Hardy, productive; cooking.

A GENERAL LIST OF APPROVED PLUMS AND DAMSONS.

A stiff clay soil is found congenial to the plum, and least favorable for harboring the *Curculio*. Trees planted in a back door yard, where the ground underneath is paved or trodden hard, and where pigs and poultry are kept, or the fallen fruit is carefully gathered up and destroyed, are most likely to escape injury.

* *Bradshaw (Large Black Imperial)*. New, large, early, good, productive.

* *Coe's Golden Drop*. Large, light yellow, good, profitable, late.

* *Columbia*. Large, dark purple, juicy, rich; fair grower, and productive.

** *Damson*. Free; productive; hardy.

* *Damson Cling*. Productive, hardy, late.

** *Early Orleans*. Size medium, rich and fine flavor, hardy and productive.

* *German Prune*. Large, oval, purple.

- ** *Imperial Gage (Prince's Gage)*. Greenish yellow, juicy, rich, sweet.
- * *Lawrence's Favorite*. Large, round, yellowish green; flesh juicy, melting and rich.
- ** *Lombard*. Medium, violet red, good, great, and certain bearer.
- * *Large Blue*. Hardy and prolific.
- * *McLaughlin*. Large, greenish yellow, sweet and fine.
- ** *Smith's Orleans*. Large and excellent, reddish purple.
- * *Yellow Egg (Magnum Bonum)*. Very large, egg-shaped, a little coarse, but excellent for marketing or cooking.
- ** *Washington*. Very large, greenish yellow, tinged with red, juicy, fine-flavored.
- ** *Wild Goose*. Originated near Nashville, Tenn.; a large red plum, of good quality, and great bearer, hardy and productive; said to withstand the attacks of the curculio.

The Other Fruits usually grown in this latitude, such as apricots, nectarines, quinces, mulberries, currants, gooseberries, raspberries, dewberries, blackberries, strawberries, and the different kinds of nuts, have but few varieties, and the choice of these varieties are usually kept by our best nurserymen. (For Grapes, see article on page 217, and for Pears, see page 231.)

Every farm should have a good family orchard; and experience has proved that wherever there is easy and quick transportation, nothing pays better than large orchards and market-farming. In many parts of the State, unfortunately, the cultivation of fruit has been sadly neglected. Recently, however, a new stimulus has been given to this industry, which will, we hope, in a few years, place Kentucky abreast of any of her sister States in the production of all kinds of fruits, berries, and nuts. No part of the United States is better adapted for orchards and vineyards than our State, and all we need is, for our people to consider their own interests, and to consult the health and comfort of their families, and then to move in this direction.

STATE COLLEGE AND NORMAL SCHOOLS.

Knowledge is the power that rules, protects, and feeds mankind. Science now controls the world. Brute force, that so long governed, has been superseded by the application of the implements, the inventions, the arts and devices of scientific research. Science has been made to demonstrate truth and to explain the never-varying laws of nature. Superstitions are crumbling, and false scholasticisms are rapidly dissipating before the bright illuminations of scientific truths. New discoveries but stimulate the investigating minds of our day to increased exertions in their search for truth in the demonstration of natural phenomena. The race of mankind no longer stands still, and progress everywhere marks the general forward movement. A busy world is around us, where brain, not muscle, guides to all that is good, beautiful, and useful. We are in the vortex and cannot stop if we wished; nor will we ever desire to cease our progress while the advancement tends towards greater liberty and happiness.

But there are leaders in this progress, as there are to everything else of human origin. These leaders are the men who think, who reason, and who pursue *science* in its development of everything locked up in the arcana of nature. Their leadership is given by development and education, which are confined to no particular race or country, but comes as the outgrowth of our present system of civilization. The *head-centres* of this developing education are to be found in the universities, colleges, and schools of our land. These lead in the development of the brain powers that rule States, governments, nations, and continents. The German universities lead the civilization of the Teutonic races. The Academy of France and other kindred institutions give tone to the civilization of the races that derive their languages from the Latin tongue. Oxford and Cambridge now head the civilization of the British people, and Yale and Harvard give tone to the literature and civilization of New England and the great cities of our Northern States. In the Western and Southern States of our country we have, unfortunately, no great head-centres of a Western and Southern civilization, because we possess no great central universities that wield a preponderating influence in the education of our people.

In consequence of this deficiency, our civilization and our educational system (if we have any) is mongrel, and is borrowed from other systems, or else is undeveloped, like a giant infant in its swaddling clothes. The great West and the Southern States need five or six large central universities, where the expanding genius of our people can be developed, and which may lead us forward into the front ranks of literature and science. We are entitled to a civilization and position among the educated men of the world, commensurate with the vastness of our territory, the immensity of our resources, and the extensive vital capacity we possess, so far superior to that of any other locality on the earth's surface.

One of these universities or colleges should be located within the territory of Kentucky. This is due to us from our centrality of position, healthfulness of climate, purity of water, cheapness of food, and the high-toned, chivalrous bearing of our people. Nowhere can be found more advantages for such an institution than here among our own citizens.

We already have the nucleus for such an institution in the land grant which has been given the State by the Federal Government, and which is now held in trust by the "Kentucky University," at Lexington. This fund, though small, amounting to only about \$168,000, can be made the pivotal point for a great university and normal school, which, as the head of our general or public school system, may arise to become the leading institution in the great Mississippi Valley.

In order to take this prominence, it must be entirely separated from all church societies and sectarian influences whatever, and must be owned and managed exclusively by the State, as a part of her general or common school system, so as to come within the purview of the law of the United States making the land grant, and also within the limitations of the provisions of our State Constitution.

It is so manifestly wrong to have either the university of the State or any branch of the common school system under religious sectarian influence, that no unprejudiced man will now desire such a consummation. We are only astonished at the short-sightedness of a former Legislature which could expect for Jews, Free-thinkers, Roman Catholics, or even other Protestant denominations, to patronize a university which was controlled by any one denomination of Christians, no matter how numerous, influential, or upright they may be. The time was when all colleges required the fostering care of some religious denomination to

foster and support them; but that day is past, and now the almost universal sentiment of all enlightened people in every country is, that the youthful mind should be educated in science and the arts, and not in scholastic sectarianism.

If, then, the future statesmen of Kentucky will look at this subject with the enlarged views of educated men of science, they will establish and maintain within our State such a public university as will educate the rising young men of our country in those sciences, arts, and literature, such as will fit them to follow the industries of farming, mechanical labor, mercantile pursuits, and all the learned professions upon the highest plane of scientific knowledge; and they will add by their achievements honor, glory, and endless fame to our good old Commonwealth.

This university should be so established that it will give free instruction not only to a specified number of State students from each county or representative district, but also to *all young men* who will obligate themselves to teach a limited number of years in some one or more of the common schools of the State, so that the instruction here given may be distributed throughout every section and in every neighborhood. This feature will make it thoroughly a *normal school* for the education of teachers. A large majority of States now have one or more such normal schools; New York has eight, and Pennsylvania has ten, and other States five or six; but for the present we may be well contented with one such as might exist within a really well-endowed State university. This is not the proper place to define all the aims and objects of such a central State university or college as is sketched in this limited chapter, but enough has been said to bring the subject before our legislators for their action.

THE DOMESTICATION OF WILD FOWLS.

Our poultry-yards are notoriously scant in the number of varieties of fowls which have been domesticated. The peafowl, the turkey, the guinea, the chicken, the duck, the goose, and the pigeon about completes the list, while "the winged birds and feathered fowls of the air" exist in almost countless varieties in a state of native wildness. It seems strange that the human family have never subdued and brought into

use more of these. Nature evidently points out many birds which might easily be introduced into the poultry yard with great profit, which would make a decided addition to the few classes we now have. I will here mention some that no doubt could, in a few generations, be permanently domesticated. Those are the wild goose, the brant, the coot or water-hen, the eider duck, the canvas-back, the blue-wing, the black diver, the teal duck, the summer duck, the surf duck, and widgeon; there are the pheasants, the prairie chicken, the Nebraska grouse, weighing more than a chicken, the curascow, and guan, fowls similar to our wild turkey, natives of Central and South America. Of the smaller birds, we could no doubt, within a few generations, domesticate the different kinds of partridges and quails, the woodcock and snipe, the moor cock, the black moor hen, the wild pigeon, the plover, the water rail, the dove, the robin, and the blackbird. Every one of these named have good brain power, are amiable, not vicious, and have most tender and delicious flesh for table use, and any one of them thoroughly domesticated and placed in the poultry-yard would be an acquisition of great value. If some of our bird fanciers would turn their attention to this subject they might make a record which would hand their names down to posterity, to be placed among the benefactors of our race.

THE PRESENT STATE GOVERNMENT OF KENTUCKY.

The Governor, Lieutenant Governor, Attorney General, Auditor, Register of Land Office, and Superintendent of Public Instruction are elected at a general State election, and hold their offices for four years. The State Treasurer is elected every two years. The following list comprises the principal officers of the State, and the counties of which they are or were citizens:

Governor	James B. McCreary	Madison.
Lieutenant Governor	John C. Underwood	Warren.
Secretary of State	J. Stoddard Johnston	Franklin.
Assistant Secretary of State	Thos. S. Bronston	Madison.
Private Secretary to the Governor	A. R. Clarke	Pendleton.
Attorney General	Thos. E. Moss	McCracken.
Librarian	Mrs. Cornelia Busb.	Louisville.
Keeper of Penitentiary	J. W. South	Franklin.
Public Printer and Binder	S. I. M. Major	Franklin.

PUBLIC ACCOUNTS.

Auditor	D. Howard Smith	Owen.
Assistant Auditor	Jas. M. Withrow	Hancock.
Clerk of Auditor	Abner H. Sinclair	Scott.
“ “	John A. Crittenden	Franklin.
“ “	L. D. Holloway	Henry.
“ “	H. F. Duncan	Warren.
“ “	R. M. Aldridge	Franklin.
“ “	Al. McGoodwin	Caldwell.
“ “	Ralph Sheldon	Nelson.

INSURANCE BUREAU.

Commissioner	Bedford Leslie	Barren.
Deputy Commissioner	Cabell B. Bullock	Fayette.
Clerk	C. T. Baird	Ohio.
Clerk	Thos. D. Gibson	Woodford.

TREASURER'S OFFICE.

Treasurer	James W. Tate	Franklin.
Clerk	James B. Hawkins	Woodford.

LAND OFFICE.

Register	Thos. D. Marcum	Lawrence.
Deputy Register	Richard Sharpe	Franklin.
Clerk	Mrs. T. D. Marcum	Lawrence.

PUBLIC INSTRUCTION.

Superintendent	H. A. M. Henderson	Bourbon.
Clerk	E. C. Went	Franklin.
Clerk	C. F. Vaughan	Franklin.

ADJUTANT GENERAL'S OFFICE.

Adjutant General	J. M. Wright	Louisville
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QUARTER-MASTER GENERAL'S OFFICE.

Quarter-Master General	J. P. Nuckols	Barren.
Clerk	L. D. Craig	Woodford.
Clerk	D. Howard Smith, jr.	Scott.

BUREAU OF AGRICULTURE, HORTICULTURE, AND STATISTICS.

Commissioner	Winston J. Davie	Christian.
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COURT OF APPEALS.

Chief Justice	William Lindsay	Hickman.
Associate Justice	W. S. Pryor	Henry.
“ “	M. H. Cofer	Hardin.
“ “	John M. Elliott	Bath.
Reporter	W. P. D. Bush	Hancock.
Clerk	Thos. C. Jones	Daviess.
Deputy Clerk	Virgil Hewitt	Hardin.
Sergeant-At-Arms	Geo. A. Robertson	Franklin.
Tipstaff	A. W. Vallandigham	Franklin.
Janitor	William French	Franklin.

JUDGES CIRCUIT COURTS IN KENTUCKY.

Elected first Monday in August, 1874, for term of six years.

1st District	W. W. Robertson	Graves.
2d District	J. R. Grace	Trigg.
3d District	B. P. Cissell	Henderson.
4th District	R. C. Bowling	Logan.
5th District	James Stewart	Daviess.
6th District	James Garnett	Barren.
7th District	J. C. Wickliffe	Nelson.
8th District	M. H. Owsley	Garrard.
9th District	W. L. Jackson	Louisville.
10th District	J. D. Hunt	Fayette.
11th District	Geo. C. Drane	Franklin.
12th District	J. S. Boyd	Harrison.
13th District	Robert Riddell	Estill.
14th District	Geo. M. Thomas	Lewis.
15th District	W. H. Randall	Knox.
16th District	W. C. Ireland	Boyd.
17th District	S. E. DeHavén	Oldham.

JUDGES OF COMMON PLEAS COURTS.

1st District	J. D. White	Ballard.
3d District	Caswell Bennett	Livingston.
8th District	Robert J. Breckinridge	Boyle.
10th District	B. F. Buckner	Fayette.
Jefferson Court of	Henry J. Stites	Louisville.
Warren Court of	W. L. Dulaney	Warren.

JUDGES OF CRIMINAL COURTS.

5th District	John Allen Murray	Breckinridge.
6th District	John Ritter	Barren.
11th District	O. D. McManama	Grant.
12th District	George G. Perkins	Kenton.
14th District	W. J. Sands	Lewis.
16th District	James E. Stewart	Lawrence.

LOUISVILLE CHANCERY COURT.

Chancellor	H. W. Bruce	Louisville.
Vice Chancellor	James Harlan	Louisville.

CHANCERY COURT.

For the counties of Campbell, Kenton, Bracken, and Pendleton.

Judge	John W. Menzies	Pendleton.
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COMMONWEALTH'S ATTORNEYS.

Elected first Monday in August, 1874, for term of six years.

1st District	B. A. Neale	Graves.
2d District	Hunter Wood	Christian.
3d District	John W. Lockett	Henderson.
4th District	D. C. Walker	Allen.

5th District	Joseph Haycraft	Hardin.
6th District	D. R. Carr	Barren.
7th District	Phil. B. Thompson, jr.	Mercer.
8th District	Geo. Denny, jr.	Garrard.
9th District	Basil W. Duke	Louisville.
10th District	J. Lawrence Jones	Fayette.
11th District	Warren Montfort	Henry.
12th District	W. W. Cleary	Kenton.
13th District	J. W. Kendall	Morgan.
14th District	A. E. Cole	Fleming.
15th District	Jas. H. Tinsley	Knox.
16th District	A. J. Auxier	Pike.
17th District	J. S. Morris	Shelby.

MEMBERS OF THE PRESENT GENERAL ASSEMBLY OF KENTUCKY.

SENATE.

The Senate is composed of thirty-eight members, half of whom are elected biennially. The following eighteen, who were elected in 1875, hold over:

SENATORS ELECTED IN 1875.

- 1st District—Hickman, Fulton, and Graves—H. A. Tyler, Hickman.
- 2d District—McCracken, Ballard, and Marshall—S. H. Jenkins, Blandville.
- 3d District—Lyon, Livingston, Calloway, and Trigg—J. B. Garnett, Cadiz.
- 4th District—Caldwell, Crittenden, and Webster—Sumner Marble, Princeton.
- 5th District—Henderson and Union—J. H. Stanley, Henderson.
- 6th District—Christian and Hopkins—C. N. Pendleton, Pembroke.
- 9th District—Logan, Simpson, and Todd—P. A. Lyon, Gordonsville.
- 11th District—Warren and Allen—George Wright, Smith's Grove.
- 17th District—Laurel, Pulaski, Whitley, Knox, Bell, and Jackson—C. W. Lester, Williamsburg.
- 19th District—Barren, Metcalfe, and Monroe—J. R. Leslie, Tompkinsville.
- 22d District—Woodford, Scott, and Jessamine—James E. Blackburn, Spring Station.
- 26th District—Bracken, Pendleton, and Grant—F. L. Cleveland, Augusta.
- 30th District—Nicholas, Harrison, and Robertson—Duncan Harding, Mt. Olivet.
- 33d District—Perry, Letcher, Clay, Harlan, Floyd, Pike, and Martin—John Hyden, Manchester.
- 34th District—Magoffin, Breathitt, Johnson, Menifee, Morgan, Wolfe, Owsley, Powell, and Lee—Jos. Gardner, Salyersville.
- 35th District—Rowan, Bath, Fleming, and Carter—A. J. Ewing, Owingsville.
- 36th District—Jefferson County and the First and Second Wards of Louisville—Pollock Barbour, Louisville.
- 37th District—Third, Fourth, Fifth, Sixth, and Seventh Wards of Louisville—R. G. Hays, Louisville.
- 38th District—Eighth, Ninth, Tenth, Eleventh, and Twelfth Wards of Louisville—J. B. Read, Louisville.

SENATORS ELECTED IN 1877.

- 7th District—Davies and McLean—Clint. Griffith, Owensboro.
- 8th District—Muhlenburg, Ohio, and Butler—Sam. E. Hill, Hartford.
- 10th District—Breckinridge, Hancock, Edmonson, and Grayson—David R. Murray, Hawesville.

- 12th District—Hardin, Meade, and Bullitt—A. B. Montgomery, Elizabethtown.
 13th District—Hart, Larue, and Green—J. W. Rowlett, Woodsonville.
 14th District—Spencer, Nelson, and Shelby—M. T. Carpenter, Shelbyville.
 15th District—Marion, Washington, and Taylor—D. G. Mitchell, Campbellsville.
 16th District—Clinton, Cumberland, Adair, Russell, and Wayne—Charles Bertram, Monticello.
 18th District—Lincoln, Boyle, Garrard, and Casey—J. H. Bruce, Lancaster.
 20th District—Anderson, Franklin, and Mercer—R. I. McQuiddy, Lawrenceburg.
 21st District—Henry, Oldham, Trimble, and Carroll—T. J. McElrath, Carrollton.
 23d District—Gallatin, Boone, and Owen—L. C. Norman, Burlington.
 24th District—Kenton—C. D. Foote, Covington.
 25th District—Campbell—Albert S. Berry, Newport.
 27th District—Fayette—P. P. Johnston, Lexington.
 28th District—Bourbon, Clark, and Montgomery—Thomas Johnson, Mt. Sterling.
 29th District—Madison, Estill, and Rockcastle—Richard J. White, Richmond.
 31st District—Mason and Lewis—James Shackelford, Maysville.
 32d District—Boyd, Greenup, Lawrence, and Elliott—George T. Halbert, Greenup.

HOUSE OF REPRESENTATIVES.

The House of Representatives consists of 100 members, elected every two years. The following comprises a list of those elected 6th August, 1877:

Josiah Hunter	Columbia	Adair.
W. J. McElroy	Butlersville	Allen.
William Neal	Lawrenceburg	Anderson.
W. J. Edrington	Arlington	Ballard.
B. Mills Parish	Glasgow	Barren.
C. R. Brooks	Owingsville	Bath and Rowan.
Granville V. Rouse	Burlington	Boone.
Green R. Keller	Paris	Bourbon.
J. Q. Lackey	Louisa	Boyd and Lawrence.
John Cowan	Danville	Boyle.
W. W. Orr	Augusta	Bracken. [goffin.
Oalloway Cope	Jackson	Breathitt, Morgan, and Ma-
T. J. Lewis	Hardinsburg	Breckinridge.
Augustine Shelburne	Taylorsville	Bullitt and Spencer.
W. L. Hazelip	Rocky Hill Station	Butler and Edmonson.
C. T. Allen	Princeton	Caldwell.
Tipton A. Miller	Murray	Calloway.
E. H. Morin	Newport	Campbell.
T. M. Hill	Alexandria	Campbell.
James F. Means	Carrollton	Carroll.
G. W. Prichard	Grayson	Carter and Elliott.
F. D. Rigney	Liberty	Casey and Russell.
John Feland	Hopkinsville	Christian.
T. J. Bush	Lexington	City of Lexington.
G. R. Snyder	Winchester	Clark.
W. T. Dicken	Albany	Clinton and Cumberland.
Otho Nunn	Marion	Crittenden and Livingston.

Clinton K. Tharp	Owensboro	Daviess.
Alexander T. Craycroft	Owensboro	Daviess.
C. W. Russell	Fitchburg	Estill and Lee.
R. A. Spurr	Chilesburg	Fayette.
James P. Allen	Flemingsburg	Fleming.
T. W. Scott	Frankfort	Franklin.
Henry Campbell	Hickman	Fulton and Hickman.
David Martin	Prestonsburg	Floyd and Johnson.
Clem. Ambrose	Warsaw	Gallatin.
James B. Mason	Lancaster	Garrard.
Wm. Points	Williamstown	Grant.
Henry George	Wingo Station	Graves.
Lev. Green	Litchfield	Grayson.
Gabriel Blevins		Green and Taylor.
W. H. Callihan	Greenup	Greenup.
J. F. Bennett	Pellville	Hancock.
M. H. Marriott	Elizabethtown	Hardin.
J. K. Bailey		Harlan, Perry, and Bell.
Wm. A. Webber	Rutland	Harrison.
Thos. Sanders	Hammonville	Hart.
Montgomery Merritt	Henderson	Henderson.
J. O'Bannon	Eminence	Henry.
L. Wilson	Madisonville	Hopkins.
Hancock Taylor	Louisville	Jefferson.
Richard Lambert	1st District, Louisville.	
Pat. Campion	2d District, Louisville.	
Dennis Gleason	3d District, Louisville.	
Lyttleton Cooke	4th District, Louisville.	
Charles Godshaw	5th District, Louisville.	
W. Scott Gresham	6th District, Louisville.	
Peter Fisher	7th District, Louisville.	
J. C. Welch	Nicholasville	Jessamine.
Milton Hamilton	Florence	Kenton.
D. A. Glenn	1st District, Covington.	
H. P. Whitaker	2d District, Covington.	
James Perkins	Williamsburg	Knox and Whitley.
T. A. Robertson	Hodgenville	Larue.
Abner Eversole	London	Laurel and Rockcastle.
Samuel Hensley	Warfield	Letcher, Pike, and Martin.
Duncan Thompson	Vanceburg	Lewis.
J. S. Owsley	Stanford	Lincoln.
E. Burr	Russellville	Logan.
W. M. Reed	Benton	Lyon and Marshall.
Ed. W. Turner	Richmond	Madison.
R. L. Spalding	Lebanon	Marion.
Thos. H. Mannen	Maysville	Mason.
J. M. Bigger	Paducah	McCracken.
W. H. Hillsman	Livermore	McLean.

Thos. H. Dittoe	Brandenburg	Meade.	[and Wolfe.
Jos. M. Kash	Hazlegreen	Menifee, Montgomery, Powell,	
John Charles Thompson	Harrodsburg	Mercer.	
J. M. Neal	Tompkinsville	Metcalf and Monroe.	
Lewis Jones	Greenville	Muhlenburg.	
J. L. Pope	Bardstown	Nelson.	
G. H. B. Thompson	Carlisle	Nicholas and Robertson.	
J. W. Meador	Fordsville	Ohio.	
J. W. Griffith	Lagrange	Oldham and Trimble.	
E. C. Bainbridge	Owenton	Owen.	
Isaac T. West	McKee	Owsley, Clay, and Jackson.	
A. R. Clarke	Falmouth	Pendleton.	
J. T. Tartar	Somerset	Pulaski.	
Wm. C. Owens	Georgetown	Scott.	
John A. Thomas	Shelbyville	Shelby.	
I. H. Goodnight	Franklin	Simpson.	
Robt. F. Allensworth	Elkton	Todd.	
Benj. F. Buie	Cerulean Springs	Trigg.	
Cromwell Adair	Morganfield	Union.	
C. U. McElroy	Bowling Green	Warren.	
G. E. Speck	Bowling Green	Warren.	
Andrew Thompson	Springfield	Washington.	
T. J. Oatts	Monticello	Wayne.	
G. H. Towery	Dixon	Webster.	
A. Buford	Midway	Woodford.	

THE NEWSPAPERS OF THE STATE.

There is no State or country where a more high-toned, ably conducted, and reliable set of newspapers are published than in the State of Kentucky. The secular press is noted for its liberality, high moral teachings, and perfect freedom from intolerance. The political newspapers, both of the cities and country towns, are conducted with marked fairness, excellent literary taste, and signal ability in their editorial departments. The scientific and industrial publications compare most favorably with any similar literature now being issued from the press in any part of the world. The people of Kentucky have good reasons to be proud of the men who at present occupy the editorial chairs of the various magazines, weekly and daily newspapers of our State. It is their brain work more than any other power that guides the destinies of the good old Commonwealth.

List of Papers Published in the State.—Ashland Review, Boyd county; Augusta Chronicle, Bracken county; Bardstown Record, Nelson county;

Blandville News, Ballard county; Bowling Green Democrat, Warren county; Burksville Courier, Cumberland county; Cadiz Democrat, Trigg county; Calhoun Progress, McLean county; Carlisle Mercury, Nicholas county; Carrollton Democrat, Carroll county; Catlettsburg Central Methodist, Boyd county; Catlettsburg Guard, Boyd county; Covington Ticket, Kenton county; Covington Church News, Kenton county; Covington Kentucky Presbyterian, Kenton county; Cynthiana Democrat, Harrison county; Cynthiana News, Harrison county; Danville Advocate, Boyle county; Elizabethtown News, Hardin county; Elkton Witness, Todd county; Eminence Constitutionalist, Henry county; Falmouth Democrat, Pendleton county; Falmouth Independent, Pendleton county; Flemingsburg Democrat, Fleming county; Flemingsburg Rambler, Fleming county; Frankfort Kentucky Yeoman, Franklin county; Frankfort Commonwealth, Franklin county; Franklin Patriot, Simpson county; Fulton Times and Observer, Fulton county; Georgetown Times, Scott county; Glasgow Times, Barren county; Greenup Independent, Greenup county; Harrodsburg Reporter, Mercer county; Hartford Herald, Ohio county; Hawesville Plaindealer, Hancock county; Henderson News, Henderson county; Henderson Reporter, Henderson county; Hickman Courier, Fulton county; Hopkinsville Democrat, Christian county; Hopkinsville New Era, Christian county; Lagrange Era, Oldham county; Lebanon Times and Kentuckian, Marion county; Lebanon Standard, Marion county; Lexington Press, Fayette county; Lexington Kentucky Gazette, Fayette county; Lexington Apostolic Times, Fayette county; Lexington Kentucky Live Stock Record, Fayette county; Lexington Childrens' Friend, Fayette county; Lexington Good Words for the Children, Fayette county; Litchfield Grayson Journal, Grayson county; London Mountain Echo, Laurel county. *Louisville*—*Daily*: Anzeiger, Commercial, Courier-Journal, Evening News, Volksblatt. *Weekly*: American Medical Weekly, Anzeiger Weekly, Weekly Courier-Journal, Commercial Weekly, Weekly News, Tobacco News, Farmers' Home Journal, Jeffersonian Democrat, Kentucky Presbyterian, Manufacturers and Merchants' Advertiser, Omnibus, Louisville Medical News, Good Templars' Advocate, Southern Agriculturalist, Volksblatt Weekly, Western Recorder, Christian Observer, Glaubensbote, Sunday Argus, Catholic Advocate, Hyatt's Southern Guide, Orphan's Friend, Christian Index. *Monthly*: Poultry Journal, American Practitioner, Louisville and Richmond Medical Journal, and the Farmers' Magazine. Madisonville Times, Hopkins county; Mayfield Democrat, Graves county; Maysville Bulletin, Mason county; Maysville Eagle,

Mason county; Maysville Republican, Mason county; Maysville Methodist Times, Mason county; Midway Blue Grass Clipper, Woodford county; Mount Olivet Tribune, Robertson county; Mt. Sterling Democrat, Montgomery county; Mt. Sterling Kentucky Sentinel, Montgomery county; Murray Gazette, Calloway county; Newport Local, Campbell county; Nicholasville Jessamine Journal, Jessamine county; Owensboro Examiner, Daviess county; Owensboro Messenger, Daviess county; Owenton News, Owen county; Owingsville News, Bath county; Paducah News, McCracken county; Paducah Sun, McCracken county; Paducah Baptist Herald, McCracken county; Paris Saturday Night, Bourbon county; Paris True Kentuckian, Bourbon county; Paris Western Citizen, Bourbon county; Princeton Banner, Caldwell county; Richmond Kentucky Register, Madison county; Russellville Herald, Lyon county; Shelbyville Sentinel, Shelby county; Somerset Reporter, Pulaski county; Somerset Children's Star, Pulaski county; Somerset Church Advocate, Pulaski county; Stanford Interior Journal, Lincoln county; Taylorsville Spencer Courier, Spencer county; Uniontown Union Local, Union county; Versailles Woodford Sun, Woodford county; Williamstown Sentinel, Grant county; Winchester Democrat, Clark county.

THE STATISTICAL TABLES.

These tables, which immediately follow, are taken from the Auditor's Report for the current year, and are in the main correct. The first table shows the contemplated money receipts, the second the contemplated expenditures, for the current fiscal year. The third table shows the average prices of land in each county as the same was listed for taxation. These prices are probably considerably below the real salable values, but are so rated as in but few cases to be oppressive to the taxpayers. The fourth table includes the general assessment, together with other necessary statistics, which are taken each year for the better information of our people. The assessments, &c., of the white population and negroes are taken separately, principally for the reason that no tax is collected from the negroes for State expenses, but all the taxes paid by them go into the free school fund, to be used exclusively in educating the negro children of the State.

No. 1.

A STATEMENT *showing the estimated expenditures of the State for the year ending 10th October, 1878:*

Asylum, Blind	\$21,000 00
Asylum, Deaf and Dumb	20,000 00
Asylum, Eastern Lunatic	108,000 00
Asylum, Western Lunatic	70,000 00
Asylum, Central Lunatic	80,000 00
Feeble-minded Institute	26,000 00
American Printing House for the Blind	10,000 00
Attorneys	9,000 00
Criminal prosecutions	133,000 00
Contingent expenses	20,000 00
Commissioners of tax	70,000 00
Clerks' services	57,000 00
Clerks paid trustees	150,000 00
Conveyance of lunatics	6,000 00
Conveyance of convicts	20,000 00
Distribution of public books	1,500 00
Decisions Court of Appeals	5,000 00
Expresses	1,000 00
Frankfort Cemetery	100 00
Scalps	11,000 00
Jailers	120,000 00
Index to general laws	100 00
Idiots	43,000 00
Louisville Court-house Commissioners	1,700 00
State Arsenal	2,000 00
Paper for public printing	12,000 00
Public printing and binding	50,000 00
Public Library	500 00
Rewards	6,000 00
Revenue Supervisors	9,000 00
Salaries	155,000 00
Stationery for public use	3,000 00
Sheriffs paid trustees	56,000 00
State Library Fund	100 00
Trustees Jury Fund	22,000 00
Geological Survey	22,000 00
Prison Inspectors and Physicians	800 00

Amount carried forward \$1,321,800 00

No. 1—Continued.

Amount brought forward	\$1,321,800 00
Appropriations	150,000 00
War claims	2,000 00
Cost of suits	8,000 00
Pay of members General Assembly	80,000 00
Total	<u>\$1,561,800 00</u>

No. 2.

ESTIMATED RECEIPTS FOR THE YEAR, 1878.

A STATEMENT of moneys which may be expected to be paid into the Treasury during the year ending on the 10th day of October, 1878, subject to the expenses of the State, viz :

Amount of revenue, 1877, chargeable to sheriffs	\$1,532,050 94
Deduct sheriffs' commissions, &c.	\$170,000 00
Deduct amount paid previous to 10th October, 1877	75,164 72
	245,164 72
	\$1,286,886 22
Of this belongs to—	
Sinking Fund	\$160,860 78
School Fund	643,443 11
	804,303 89
Leaving for revenue	\$482,582 33
From Clerks	\$150,000 00
From corporations	275,000 00
From Trustees Jury Fund	25,000 00
From turnpike roads	30,000 00
From Sheriffs, &c.	65,000 00
From Sinking Fund	100,000 00
	645,000 00
Total estimated receipts for 1878	\$1,127,582 33
Add balance in Treasury 10th October, 1877	583,394 78
Making	\$1,710,977 11
Deduct estimated expenses for 1878	1,561,800 00
Estimated surplus 10th October, 1878	\$159,177 11

No. 3.

A STATEMENT showing the average value per acre of land in the different counties for the years 1876 and 1877; also the increase and decrease value per acre as reported to this office, to-wit :

COUNTIES.	Average value per acre, 1876.	Average value per acre, 1877.	Increase.	Decrease.
Adair	\$5 11	\$5 24	\$0 13	
Allen	5 90	5 75		\$0 15
Anderson	10 04	9 84		20
Ballard	7 05	6 91		14
Barren	8 22	7 97		25
Bath	11 38	10 77		61
Bell	1 36	1 39	03	
Boone	27 40	27 77	37	
Bourbon	43 38	44 28	90	
Boyd	12 60	13 56	96	
Boyle	23 08	23 48	40	
Bracken	18 36	17 50		86
Breathitt	98	83		15
Breckinridge	6 58	6 38		20
Bullitt	10 15	9 88		27
Butler	4 29	3 89		40
Caldwell	6 32	6 17		15
Calloway	5 71	5 61		10
Campbell	43 49	38 69		4 80
Carroll	19 93	19 39		60
Carter	4 96	4 46		50
Casey	4 45	4 36		09
Christian	8 77	8 38		39
Clark	25 56	25 01		55
Clay	1 35	1 45	10	
Clinton	5 83	5 89	06	
Crittenden	6 37	6 15		22
Cumberland	6 90	6 75		15
Daviess	15 09	14 34		75
Edmonson	3 90	3 71		19
Estill	6 01	5 06		95
Elliott	3 07	3 11	04	
Fayette	44 74	44 57		17
Fleming	13 43	12 00		1 43
Floyd	2 41	1 88		53
Franklin	19 12	18 67		45
Fulton	10 54	9 59		95
Gallatin	20 50	18 96		1 54
Garrard	17 80	17 64		16
Grant	15 12	14 58		54
Graves	8 36	7 97		39
Grayson	4 14	3 75		39
Green	5 17	4 98		19
Greenup	7 35	7 12		23
Hancock	9 51	8 94		57
Hardin	6 28	5 87		41
Harlan	1 13	1 45	32	
Harrison	19 94	19 46		48
Hart	7 34	6 66		68
Henderson	10 95	10 46		49
Henry	18 97	17 92		1 05

No. 3—Continued.

COUNTIES.	Average value per acre, 1876.	Average value per acre, 1877.	Increase.	Decrease.
Hickman	\$8 86	\$7 96		\$0 90
Hopkins	4 84	4 58		26
Jackson	2 28	2 12		16
Jefferson	49 46	42 06		7 40
Jessamine	25 47	22 94		2 53
Johnson	3 58	3 50		08
Kenton	32 58	35 56	\$2 98	
Knox	3 23	3 25	02	
Larue	7 54	7 57	03	
Laurel	2 90	2 88		02
Lawrence	3 85	2 84		1 01
Lee	3 28	2 73		55
Letcher	81	97	16	
Lewis	5 18	5 07		11
Lincoln	14 37	14 85	48	
Livingston	5 87	5 82		05
Logan	8 36	8 08		28
Lyon	5 18	5 05		13
Madison	18 73	18 50		23
Magoffin	2 23	2 19		04
Marion	9 89	9 65		24
Marshall	5 41	5 12		29
Martin	1 35	1 52	17	
Mason	32 40	31 92		48
McCracken	10 53	9 30		1 23
McLean	7 42	7 52	10	
Meade	8 07	8 32	25	
Menifee	1 02	1 14	12	
Mercer	17 92	17 40		52
Metcalfe	5 50	5 65	15	
Monroe	5 10	4 94		16
Montgomery	21 27	20 32		95
Morgan	2 12	1 99		13
Muhlenburg	5 32	5 11		21
Nelson	12 00	11 45		55
Nicholas	18 47	18 47		
Ohio	6 18	5 87		31
Oldham	17 63	18 23	60	
Owen	10 44	9 82		62
Owsley	3 66	3 08		58
Pendleton	13 62	13 34		28
Perry	56	53		03
Pike	1 65	1 78	13	
Powell	3 35	3 79	44	
Pulaski	4 00	3 85		15
Robertson	11 27	10 54		73
Rockcastle	3 68	3 50		18
Rowan	1 84	1 95	11	
Russell	4 89	4 81		08
Scott	29 34	25 83		3 51
Shelby	24 25	23 65		60
Simpson	9 65	9 27		38
Spencer	13 51	13 10		41
Taylor	5 27	5 20		07
Todd	8 28	8 31	03	
Trigg	5 61	5 72	11	
Trimble	14 78	13 82		96

No. 3—Continued.

COUNTIES.	Average value per acre, 1876.	Average value per acre, 1877.	Increase.	Decrease.
Union -----	\$11 10	\$8 69	-----	\$2 41
Warren -----	12 91	11 75	-----	1 16
Washington -----	10 02	9 85	-----	17
Wayne -----	4 30	4 28	-----	02
Webster -----	6 23	6 03	-----	20
Whitley -----	1 71	1 86	\$0 15	-----
Wolfe -----	3 05	3 09	04	-----
Woodford -----	35 31	35 06	-----	25

No. 4.

THIS STATEMENT exhibits the entire taxable property in the Commonwealth of Kentucky for the years the increase and decrease of each and every item. There is also exhibited at the end of this Table also the number of negro children between 6 and 20 years old, and number of male negroes over 21 years

COUNTIES.	Acres of land, 1876.	Acres of land, 1877.	Increase.	Decrease.	Value of land, 1876.
Adair	220,669	219,264		1,405	\$1,138,122
Allen	195,136	193,522		1,614	1,151,144
Anderson	114,919	114,190		729	1,153,780
Ballard	229,075	240,070	10,995		1,615,665
Barren	261,563	264,109	2,546		2,152,486
Bath	165,072	164,217		855	1,878,555
Bell	230,624	252,303	21,679		315,741
Boone	159,334	151,044		8,290	4,366,182
Bourbon	170,894	173,318	2,424		7,414,298
Boyd	109,222	99,257		9,965	1,376,296
Boyle	106,068	105,682		386	2,448,912
Bracken	117,393	120,556	3,163		2,155,465
Breathitt	543,522	614,285	70,763		536,396
Breckinridge	314,652	322,577	7,925		2,070,302
Bullitt	164,031	159,339		4,692	1,665,228
Butler	232,443	243,914	11,471		998,897
Caldwell	186,180	182,447		3,733	1,176,405
Calloway	245,608	242,026		3,582	1,402,779
Campbell	80,256	86,852	6,596		3,490,652
Carroll	76,570	77,076	506		1,526,455
Carter	265,620	251,791		13,829	1,319,740
Casey	219,547	217,310		2,237	977,970
Christian	370,946	361,811		9,135	3,255,388
Clark	153,113	153,116	3		3,914,804
Clay	512,886	541,126	28,240		693,511
Clinton	99,990	103,829	3,839		583,469
Crittenden	194,814	196,294	1,480		1,241,590
Cumberland	129,495	130,575	1,080		895,426
Daviess	256,595	264,608	8,013		3,872,303
Edmonson	185,087	180,810		4,277	723,630
Estill	154,347	166,775	12,428		928,280
Elliott	137,557	133,090		4,467	422,783
Fayette	173,154	172,523		631	7,748,285
Fleming	203,302	207,310	4,008		2,731,410
Floyd	273,210	378,346	105,136		658,832
Franklin	125,340	122,568		2,772	2,397,698
Fulton	98,237	107,930	9,693		1,035,540
Gallatin	59,699	60,754	1,055		1,224,044
Garrard	133,900	133,976	76		2,412,205
Grant	141,170	150,909	9,739		2,135,375
Graves	316,615	313,664		2,951	2,649,132
Grayson	267,631	285,656	18,025		1,110,057
Green	154,040	152,940		1,100	797,874
Greenup	213,087	209,396		3,691	1,568,064
Hancock	105,055	108,350	3,295		999,155
Hardin	318,944	293,836		25,108	2,004,214
Harlan	437,046	281,225		155,821	495,156
Harrison	184,894	185,682	788		3,688,074
Hart	226,118	231,410	5,292		1,661,430
Henderson	253,719	254,328	609		2,778,333
Henry	158,855	161,531	2,676		3,014,340
Hickman	134,661	137,923	3,262		1,193,525
Hopkins	288,328	297,099	8,771		1,397,433
Jackson	154,637	156,752	2,115		352,655
Jefferson	210,393	222,398	12,005		10,407,467
Jessamine	94,385	114,001	19,616		2,404,215
Johuson	162,235	168,034	5,799		581,034
Kenton	105,169	95,913		9,256	3,427,309

No. 4—Continued.

1876 and 1877, stating each county separately; also, showing the grand total, with valuation, the tax, the total taxable property of the negroes in the Commonwealth of Kentucky in the years 1876 and 1877; old, for the years 1876 and 1877, and increase and decrease in each:

Value of land, 1877.	Increase.	Decrease.	No. of town lots, 1876.	No. of town lots, 1877.	Increase.	Decrease.
\$1,149,033	\$10,911		89	103	14	
1,113,133		\$38,011	181	162		19
1,123,895		29,855	143	147	4	
1,658,573	42,908		366	381	15	
2,103,717		48,769	334	348	14	
1,769,040		109,515	233	252	19	
353,915	38,174		21	26	5	
4,195,163		171,019	604	583		21
7,675,517	261,219		634	674	40	
1,346,424		29,872	1,762	1,769	7	
2,481,312	32,400		471	476	5	
2,110,051		45,414	455	493	38	
510,323		26,073	28	28		
2,059,599		10,703	529	521		8
1,576,703		89,525	293	224		69
950,646		48,251	178	192	14	
1,126,507		49,898	248	255	7	
1,359,145		43,634	180	193	13	
3,360,622		130,030	5,713	6,886	1,173	
1,494,835		31,620	541	562	21	
1,124,896		194,844	231	225		6
949,094		28,876	58	51		7
3,033,540		221,848	617	673	56	
3,829,253		85,551	248	252	4	
785,317	91,806		21	14		7
612,260	28,791		132	118		14
1,207,317		34,273	243	252	9	
881,142		14,284	72	71		1
3,796,505		75,798	1,403	1,443	40	
670,871		52,759	183	198	15	
845,411		82,869	60	57		3
414,852		7,931	60	66	6	
7,609,692		138,593	2,240	2,275	35	
2,488,640		242,770	391	428	37	
713,415	54,583		39	51	12	
2,288,957		108,741	603	645	42	
1,035,385		155	1,497	1,551	54	
1,152,332		71,712	236	240	4	
2,364,090		48,115	168	188	20	
2,200,667	65,292		142	140		2
2,499,378		149,754	466	483	17	
1,071,080		38,977	293	305	12	
763,019		34,855	126	141	15	
1,491,008		77,056	366	369	3	
968,930		30,225	332	330		2
1,725,446		278,768	541	529		12
410,465		84,691	31	32	1	
3,615,146		72,934	524	533	9	
1,541,731		119,699	359	332		27
2,660,294		118,039	1,437	1,392		45
2,905,263		109,077	1,695	463		1,232
1,098,677		94,848	719	709		10
1,360,611		36,822	973	994	21	
332,570		20,085	38	37		1
9,355,645		1,051,822	18,026	19,134	1,108	
2,615,240	211,025		183	333	150	
588,618	7,584		68	70	2	
3,411,330		15,979	6,936	7,258	322	

No. 4—Continued.

COUNTIES.	Acres of land, 1876.	Acres of land, 1877.	Increase.	Decrease.	Value of land, 1876.
Knox	183,379	193,273	9,894		\$593,451
Larue	155,184	157,479	2,295		1,170,871
Laurel	192,731	195,518	2,787		560,155
Lawrence	256,395	361,000	104,605		987,449
Lee	113,455	130,717	17,262		372,655
Letcher	460,985	392,340		68,645	373,536
Lewis	302,029	305,043	3,014		1,565,224
Lincoln	194,884	188,839		6,045	2,800,915
Livingston	188,402	187,341		1,061	1,107,440
Logan	308,880	309,358	478		2,565,717
Lyon	134,185	132,979		1,206	695,972
Madison	257,090	257,722	632		4,817,100
Magoffin	242,280	230,714		11,566	542,101
Marion	193,427	199,395	5,968		1,914,803
Marshall	201,213	200,960		253	1,089,730
Martin	165,422	160,497		4,925	216,002
Mason	142,147	142,938	791		4,606,382
McCracken	149,318	149,894	576		1,572,330
McLean	134,136	137,971	3,835		995,927
Meade	170,996	168,486		2,510	1,381,404
Menifee	157,060	137,699		19,361	160,629
Mercer	139,948	131,400		8,548	2,508,782
Metcalf	172,580	161,167		11,413	949,957
Monroe	186,082	187,516	1,434		950,128
Montgomery	109,882	113,036	3,154		2,337,662
Morgan	364,140	357,002		7,138	771,761
Muhlenburg	253,976	254,613	637		1,353,140
Nelson	253,653	252,372		1,281	3,041,970
Nicholas	117,429	115,957		1,472	2,169,290
Ohio	335,921	341,674	5,753		2,076,399
Oldham	113,599	113,393		206	2,603,329
Owen	180,726	183,048	2,322		1,887,242
Owsley	103,117	120,645	17,528		377,594
Pendleton	159,922	162,307	2,385		2,178,360
Perry	740,970	747,021	6,051		411,816
Pike	659,835	620,979		38,856	1,093,103
Powell	82,448	78,715		3,733	276,356
Pulaski	349,305	344,238		5,067	1,397,808
Robertson	60,839	61,430	591		686,050
Rockcastle	166,705	169,619	2,914		614,090
Rowan	195,746	180,113		15,633	361,769
Russell	155,465	156,007	542		761,549
Scott	154,653	170,439	19,786		4,421,175
Shelby	231,158	231,519	361		5,607,506
Simpson	139,194	137,973		1,221	1,343,254
Spencer	115,163	113,674		1,489	1,556,626
Taylor	154,554	152,040		2,514	814,761
Todd	208,693	203,856		4,837	1,728,597
Trigg	264,387	265,132	745		1,484,205
Trimble	90,245	90,335	90		1,334,440
Union	208,321	231,839	23,518		2,312,390
Warren	291,617	299,790	8,173		3,765,537
Washington	172,200	174,715	2,515		1,726,281
Wayne	256,279	258,209	1,930		1,104,344
Webster	183,842	184,531	689		1,146,805
Whitley	389,281	371,848		17,433	700,690
Wolfe	116,273	124,729	8,456		355,339
Woodford	115,350	114,874		476	4,073,590
Total	23,890,148	24,049,555	666,822	507,415	\$211,508,998

No. 4—Continued.

Value of land, 1877.	Increase.	Decrease.	No. of town lots, 1876.	No. of town lots, 1877.	Increase.	Decrease.
\$629,136	\$35,685		42	42		
1,193,075	22,204		100	100		
563,526	3,371		54	57	3	
1,025,255	37,806		101	103	2	
357,798		\$14,857	87	72		15
382,684	9,148		30	28		2
1,547,294		17,930	430	352		78
2,806,164	5,249		262	260		2
1,094,058		13,382	358	333		25
2,500,429		65,288	617	623	6	
670,758		25,214	497	382		115
4,769,530		47,570	369	376	7	
505,710		36,391	31	33	2	
1,925,037	10,234		462	470	8	
1,030,189		59,541	345	329		16
244,475	28,473		30	39	9	
4,562,790		43,592	1,613	1,548		65
1,495,255		77,075	2,556	2,596	40	
1,028,088	32,161		456	461	5	
1,381,994	590		205	191		14
157,319		3,310	40	48	8	
2,287,065		221,717	359	353		6
911,926		38,031	53	61	8	
926,896		23,232	114	131	17	
2,296,817		40,845	277	333	56	
711,103		60,658	59	45		14
1,302,268		50,872	466	420		46
2,892,085		149,885	306	420	114	
2,141,540		27,750	206	196		10
2,007,345		69,054	452	487	35	
2,067,438	64,109		416	374		42
1,798,773		88,469	238	209		29
372,754		4,840	22	25	3	
2,166,030		12,330	421	412		9
398,059		13,757	22	17		5
1,107,030	13,927		48	47		1
297,413	21,057		23	19		4
1,326,472		71,336	141	132		9
647,490		38,563	98	90		8
594,040		20,050	56	72	16	
351,980		9,789	49	56	7	
751,824		9,725	136	138	2	
4,402,500		18,675	261	270	9	
5,475,683		131,823	445	491	46	
1,278,934		64,320	323	320		3
1,490,095		66,531	174	202	28	
790,656		24,105	163	188	25	
1,695,615		32,982	389	408	19	
1,519,057	34,852		284	279		5
1,248,835		85,605	192	191		1
2,015,304		297,086	1,098	1,109	11	
3,522,810		242,727	973	1,062	89	
1,721,864		4,417	180	185	5	
1,105,566	1,222		38	45	7	
1,113,210		33,595	593	317		276
694,450		6,240	118	103		15
385,787	30,448		49	72	23	
4,028,155		45,435	376	394	18	
\$205,650,667	\$1,195,229	\$7,053,560	73,063	74,773	4,011	2,301

No. 4—Continued.

COUNTIES.	Value of town lots, 1876.	Value of town lots, 1877.	Increase.	Decrease.	Horses and mares, 1876.
Adair	\$66,180	\$74,812	\$8,632		3,644
Allen	42,220	37,790		\$4,430	3,422
Anderson	107,970	111,955	3,985		2,274
Ballard	100,585	102,395	1,810		3,472
Barren	268,300	247,430		20,870	5,701
Bath	169,475	160,255		9,220	4,045
Bell	12,765	12,520		245	764
Boone	226,235	218,940		7,295	4,047
Bourbon	938,305	912,130		26,175	5,166
Boyd	1,168,202	1,077,145		91,057	1,186
Boyle	713,265	702,435		10,830	2,811
Bracken	373,215	378,625	5,410		4,563
Breathitt	8,031	6,931		1,100	937
Breckinridge	295,420	288,340		7,080	4,562
Bullitt	86,046	80,307		5,739	2,583
Butler	57,067	54,820		2,247	3,069
Caldwell	244,102	206,282		37,820	2,546
Calloway	62,966	57,281		5,685	2,569
Campbell	5,446,741	5,062,495		384,246	3,216
Carroll	342,455	338,300		4,155	2,337
Carter	57,363	52,765		4,598	2,102
Casey	30,655	27,640		3,015	3,050
Christian	770,350	741,480		28,870	4,717
Clark	241,150	232,205		8,945	3,709
Clay	19,925	12,800		7,125	1,435
Clinton	21,385	20,370		1,015	1,474
Crittenden	199,299	111,306	2,007		2,830
Cumberland	50,700	52,200	1,500		1,949
Daviess	1,632,155	1,619,475		12,680	6,555
Edmonson	23,670	24,130	460		1,683
Estill	47,895	45,125		2,770	2,070
Elliott	8,701	7,725		976	1,196
Fayette	3,146,200	3,026,515		119,685	5,697
Fleming	299,810	306,845	7,035		5,211
Floyd	19,595	21,400	1,805		1,629
Franklin	1,412,690	1,391,595		21,095	4,354
Fulton	237,576	239,985	2,409		1,679
Gallatin	119,500	114,950		4,550	1,773
Garrard	220,400	207,275		13,125	3,638
Grant	164,282	152,420		11,862	4,511
Graves	317,290	305,905		11,385	5,009
Grayson	95,880	93,640		2,240	3,111
Green	36,610	36,505		105	3,007
Greenup	214,958	215,505	547		2,186
Hancock	160,800	159,040		1,760	1,976
Hardin	283,310	263,705		19,605	6,067
Harlan	4,700	5,025	325		790
Harrison	570,795	572,050	1,255		6,952
Hart	136,847	117,352		19,495	4,123
Henderson	1,699,985	1,529,352		170,633	4,080
Henry	287,655	288,002	347		4,599
Hickman	178,449	165,426		13,023	2,194
Hopkins	416,445	356,410		60,035	4,584
Jackson	6,415	5,830		585	1,049
Jefferson	37,738,102	36,842,565		895,537	7,059
Jessamine	164,120	203,435	39,315		3,305
Johnson	36,050	37,712	1,662		1,320
Kenton	10,213,240	10,164,170		49,070	3,911
Knox	39,040	32,282		6,758	1,715
Larue	65,375	63,770		1,605	3,308

No. 4—Continued.

Horses and mares, '77.	Increase.	Decrease.	Value of horses & mares, 1876.	Value of horses & mares, 1877.	Increase.	Decrease.
3,724	80	-----	\$191,278	\$190,440	-----	\$838
3,461	39	-----	158,541	148,341	-----	10,200
3,202	928	-----	124,360	116,610	-----	7,750
3,599	127	-----	177,500	170,321	-----	7,179
5,673	-----	28	262,810	256,160	-----	6,650
4,252	207	-----	149,765	129,070	-----	19,695
794	30	-----	39,072	37,641	-----	1,431
4,338	291	-----	199,436	188,760	-----	10,676
5,137	-----	29	191,171	198,050	\$6,879	-----
1,220	34	-----	69,483	63,012	-----	6,471
2,683	-----	128	120,105	105,680	-----	14,425
4,588	25	-----	235,040	214,389	-----	20,660
960	23	-----	48,320	50,690	2,370	-----
4,799	237	-----	272,505	272,050	-----	455
2,644	61	-----	133,159	129,130	-----	4,029
3,017	-----	52	137,123	133,246	-----	3,877
2,524	-----	22	139,702	131,353	-----	8,349
2,483	-----	86	127,775	120,785	-----	6,990
3,064	-----	152	164,423	156,600	-----	7,823
2,385	48	-----	104,675	102,830	-----	1,845
2,124	22	-----	113,480	105,840	-----	7,640
3,062	12	-----	133,471	126,775	-----	6,696
4,598	-----	119	229,625	232,790	3,165	-----
3,720	11	-----	107,885	111,265	3,380	-----
1,487	52	-----	77,146	75,558	-----	1,588
1,561	87	-----	78,896	76,545	-----	2,345
2,883	53	-----	164,260	154,955	-----	9,305
1,876	-----	73	95,445	87,988	-----	7,457
6,779	224	-----	351,372	328,220	-----	23,152
1,725	42	-----	85,321	80,925	-----	4,396
2,106	36	-----	84,657	78,425	-----	6,232
1,201	5	-----	63,737	61,698	-----	2,039
5,608	-----	89	246,125	268,885	22,760	-----
5,466	255	-----	264,365	243,582	-----	20,783
1,646	17	-----	79,995	78,318	-----	1,677
4,225	-----	129	202,514	189,062	-----	13,452
1,668	-----	11	86,620	76,200	-----	10,420
1,797	24	-----	87,296	85,385	-----	1,911
3,955	317	-----	158,160	157,360	-----	800
4,833	322	-----	202,482	204,889	2,407	-----
5,047	38	-----	267,886	230,025	-----	37,861
4,291	1,180	-----	199,995	197,005	-----	2,990
2,992	-----	15	129,215	116,470	-----	12,745
2,130	-----	56	121,092	113,775	-----	7,317
1,923	-----	53	111,495	103,375	-----	8,120
5,603	-----	464	260,675	237,305	-----	23,370
856	66	-----	43,528	43,802	274	-----
6,874	-----	78	291,490	275,540	-----	15,950
4,304	181	-----	206,292	194,603	-----	11,689
3,898	-----	182	195,438	179,615	-----	15,823
4,862	263	-----	206,675	199,822	-----	6,853
2,228	34	-----	111,785	103,629	-----	8,156
4,391	-----	193	192,060	172,565	-----	19,495
1,016	-----	33	55,690	51,015	-----	4,675
6,993	-----	66	631,064	366,575	-----	264,489
3,247	-----	58	114,220	123,540	9,320	-----
1,391	71	-----	71,174	72,878	1,704	-----
3,970	59	-----	204,985	208,615	3,630	-----
1,479	-----	236	80,838	72,909	-----	7,929
3,315	7	-----	160,275	154,275	-----	6,000

No. 4—Continued.

COUNTIES.	Value of town lots, 1876.	Value of town lots, 1877.	Increase.	Decrease.	Horses and mares, 1876.
Laurel	\$39,675	\$41,175	\$1,500		1,492
Lawrence	90,945	98,925	7,980		2,122
Lee	35,637	35,790	153		576
Letcher	9,125	8,475		\$650	847
Lewis	181,990	178,648		3,342	3,259
Lincoln	249,925	246,840		3,085	3,030
Livingston	93,770	83,240		10,530	2,036
Logan	448,535	424,920		23,615	5,088
Lyon	107,044	87,854		19,190	1,269
Madison	653,350	665,900	12,550		7,371
Magoffin	12,950	12,100		850	1,099
Marion	414,375	416,730	2,355		4,246
Marshall	60,378	52,624		7,754	2,279
Martin	7,567	8,182	615		290
Mason	1,318,760	1,226,673		92,087	5,252
McCracken	2,637,395	2,410,135		227,260	1,817
McLean	124,265	126,562	2,297		2,588
Meade	79,331	74,608		4,723	3,019
Menifee	9,185	10,815	1,630		550
Mercer	397,100	364,735		32,365	4,354
Metcalfe	17,695	16,357		1,338	2,711
Monroe	15,230	16,955	1,725		3,059
Montgomery	375,505	388,055	12,550		2,814
Morgan	21,210	19,180		2,030	1,864
Muhlenburg	188,367	181,591		6,776	4,289
Nelson	342,165	337,165		5,000	5,037
Nicholas	198,750	191,600		7,150	4,135
Ohio	189,375	192,660	3,285		5,437
Oldham	287,040	183,165		103,875	2,764
Owen	127,603	122,629		4,974	5,286
Owsley	10,550	11,250	700		762
Pendleton	259,275	254,790		4,485	5,017
Perry	4,289	4,195		94	769
Pike	64,515	63,725		790	1,671
Powell	6,700	5,460		1,240	708
Pulaski	96,662	89,094		7,568	4,555
Robertson	44,100	40,190		3,910	2,159
Rockcastle	27,300	29,975	2,675		1,802
Rowan	12,285	13,970	1,685		898
Russell	20,075	19,365		710	1,992
Scott	497,025	476,650		20,375	5,388
Shelby	566,515	582,225	15,710		5,884
Simpson	323,310	298,265		25,045	3,055
Spencer	67,895	59,890		8,005	2,827
Taylor	82,272	81,385		887	2,530
Todd	150,210	159,375	9,165		2,735
Trigg	139,415	129,060		10,355	2,552
Trimble	67,280	61,200		6,080	2,648
Union	362,909	347,440		15,469	5,142
Warren	1,188,500	1,175,185		13,315	6,271
Washington	94,510	100,000	5,490		4,717
Wayne	31,125	31,450	325		3,086
Webster	146,320	150,120	3,800		3,800
Whitley	25,415	27,365	1,950		1,975
Wolfe	17,795	20,178	2,383		1,033
Woodford	391,100	383,250		7,850	4,272
Total	\$85,460,501	\$82,836,415	\$169,027	\$2,793,113	362,750

No. 4—Continued.

Horses and mares, '77.	Increase.	Decrease.	Value of horses & mares, 1876.	Value of horses & mares, 1877.	Increase.	Decrease.
1,504	12	-----	\$74,365	\$70,833	-----	\$3,532
2,173	51	-----	112,382	114,477	\$2,095	-----
565	-----	11	31,804	31,095	-----	709
875	28	-----	46,430	45,544	-----	886
3,464	205	-----	170,876	160,855	-----	10,021
4,072	1,042	-----	173,835	158,155	-----	15,680
2,040	4	-----	123,904	115,065	-----	8,839
4,986	-----	102	215,890	190,982	-----	24,908
1,253	-----	16	68,960	62,149	-----	6,811
6,485	-----	886	323,120	305,680	-----	17,440
1,170	71	-----	59,527	61,252	1,725	-----
4,608	362	-----	165,870	165,508	-----	362
2,022	-----	257	115,600	104,300	-----	11,300
276	-----	14	15,677	15,210	-----	467
5,344	92	-----	230,920	221,010	-----	9,910
1,732	-----	85	93,595	91,900	-----	1,695
2,578	-----	10	141,335	135,175	-----	6,160
3,039	20	-----	148,020	137,492	-----	10,528
558	8	-----	21,005	20,290	-----	715
3,121	-----	1,233	183,485	161,166	-----	22,319
2,837	126	-----	138,055	132,496	-----	5,559
3,026	-----	33	145,140	135,557	-----	9,583
2,777	-----	37	82,625	67,422	-----	15,203
2,023	159	-----	100,829	98,984	-----	1,845
3,037	-----	1,252	137,326	132,356	-----	4,970
5,128	91	-----	213,865	202,950	-----	10,915
4,228	93	-----	159,200	141,550	-----	17,650
5,382	-----	55	263,533	254,815	-----	8,718
2,701	-----	63	119,840	110,410	-----	9,430
5,541	255	-----	224,195	211,102	-----	13,093
799	37	-----	44,387	44,981	594	-----
5,564	547	-----	268,615	255,495	-----	13,120
796	27	-----	41,680	42,965	1,285	-----
1,666	-----	5	103,855	100,125	-----	3,730
756	48	-----	31,760	29,093	-----	2,667
4,704	149	-----	219,481	205,259	-----	14,222
2,203	44	-----	102,970	94,185	-----	8,785
1,874	72	-----	93,975	92,670	-----	1,305
874	-----	24	47,365	43,303	-----	4,062
2,006	14	-----	104,360	101,639	-----	2,721
5,482	94	-----	225,150	218,850	-----	6,300
5,985	101	-----	243,530	238,155	-----	5,375
2,977	-----	78	138,566	122,572	-----	15,994
3,026	199	-----	82,405	72,460	-----	9,945
2,535	5	-----	117,312	112,501	-----	4,811
2,774	39	-----	132,560	134,525	1,965	-----
2,463	-----	89	147,513	131,638	-----	15,875
2,728	80	-----	135,965	130,650	-----	5,315
5,227	85	-----	211,725	186,125	-----	25,600
6,230	-----	41	282,018	263,080	-----	18,938
4,783	66	-----	180,009	174,351	-----	5,658
3,143	57	-----	157,082	144,365	-----	12,717
3,619	-----	181	189,820	168,040	-----	21,780
2,016	41	-----	101,555	93,550	-----	8,005
1,009	-----	24	54,096	50,967	-----	3,129
4,076	-----	196	220,960	189,410	-----	31,550
365,537	9,832	7,044	\$17,394,882	\$16,253,886	\$63,553	\$1,204,550

No. 4—Continued.

COUNTIES.	Mules, 1876.	Mules, 1877.	Increase.	Decrease.	Value of mules, 1876.
Adair	1,281	1,389	108		\$52,030
Allen	1,754	1,910	156		86,645
Anderson	684	623		61	19,140
Ballard	2,103	2,246	143		121,140
Barren	1,831	1,763		68	81,929
Bath	1,375	1,148		227	40,045
Bell	143	181	38		7,671
Boone	824	814		10	43,245
Bourbon	2,299	2,141		158	91,440
Boyd	241	281	40		16,925
Boyle	1,154	1,052		102	46,705
Bracken	247	229		18	9,630
Breathitt	174	203	29		8,745
Breckinridge	1,356	1,431	75		92,780
Bullitt	563	642	79		34,930
Butler	969	1,066	97		46,852
Caldwell	1,535	1,662	127		97,149
Calloway	2,350	2,447	97		141,215
Campbell	466	472	6		26,765
Carroll	440	394		46	18,460
Carter	434	455	21		24,773
Casey	769	791	22		26,213
Christian	2,890	3,572	682		199,260
Clark	1,347	1,306		41	40,685
Clay	590	633	43		30,434
Clinton	478	496	18		21,715
Crittenden	1,686	1,776	90		111,135
Cumberland	579	625	46		27,160
Daviess	1,308	1,325	17		83,935
Edmonson	346	354	8		19,260
Estill	774	752		22	26,713
Elliott	158	164	6		6,790
Fayette	1,384	1,535	151		59,175
Fleming	1,131	1,062		69	41,955
Floyd	304	322	18		13,708
Franklin	826	785		41	35,930
Fulton	1,167	1,122		45	71,935
Gallatin	351	310		41	14,732
Garrard	1,586	1,480		106	87,665
Grant	821	696		125	28,412
Graves	3,293	3,392	99		254,479
Grayson	729	776	47		34,235
Green	953	1,978	1,025		40,495
Greenup	545	530		15	28,245
Hancock	446	496	50		28,540
Hardin	1,354	1,255		99	56,215
Harlan	281	182		99	12,627
Harrison	2,293	1,943		350	71,015
Hart	1,150	1,228	78		60,733
Henderson	2,621	2,641	20		150,395
Henry	911	659		252	35,015
Hickman	1,361	1,464	103		77,391
Hopkins	1,783	2,047	264		85,975
Jackson	178	183	5		8,220
Jefferson	2,116	2,134	18		118,285
Jessamine	968	988	20		30,725
Johnson	234	262	28		13,120
Kenton	502	408		94	29,725
Knox	678	721	43		32,558
Larue	646	578		68	27,525

No. 4—Continued.

Value of mules, 1877.	Increase.	Decrease.	Jennies, 1876.	Jennies, 1877.	Increase.	Decrease.
\$61,395	\$9,365	-----	62	54	-----	8
92,281	5,636	-----	37	23	-----	14
19,140	-----	-----	19	16	-----	3
117,610	-----	\$3,530	31	31	-----	-----
81,382	-----	547	24	3	-----	21
30,395	-----	9,650	25	32	7	-----
8,853	1,182	-----	16	20	4	-----
40,535	-----	2,710	54	21	-----	33
91,480	40	-----	91	52	-----	39
17,212	287	-----	6	5	-----	1
40,650	-----	6,055	26	36	10	-----
8,505	-----	1,125	11	8	-----	3
9,400	655	-----	32	31	-----	1
94,910	2,130	-----	25	24	-----	1
34,542	-----	388	21	17	-----	4
49,428	2,576	-----	36	30	-----	6
95,563	-----	1,586	16	20	4	-----
134,885	-----	6,330	15	25	10	-----
26,936	171	-----	9	4	-----	5
15,444	-----	3,016	-----	-----	-----	-----
24,169	-----	604	27	12	-----	15
26,748	535	-----	61	59	-----	2
211,745	12,485	-----	32	28	-----	4
41,820	1,135	-----	21	18	-----	3
32,054	1,620	-----	23	23	-----	-----
22,730	1,015	-----	21	17	-----	4
108,097	-----	3,038	20	18	-----	2
28,542	1,382	-----	15	10	-----	5
79,240	-----	4,695	9	10	1	-----
18,135	-----	1,125	11	10	-----	1
27,756	1,043	-----	15	12	-----	3
7,040	250	-----	24	22	-----	2
69,385	10,210	-----	2	4	2	-----
42,005	50	-----	14	5	-----	9
14,238	530	-----	25	26	1	-----
32,953	-----	2,977	35	57	22	-----
60,245	-----	11,690	10	9	-----	1
13,880	-----	852	2	-----	-----	2
60,285	-----	7,380	37	18	-----	19
23,593	-----	4,819	23	21	-----	2
233,135	-----	21,344	32	38	6	-----
33,760	-----	475	38	35	-----	3
38,770	-----	1,725	19	11	-----	8
35,130	-----	3,115	13	11	-----	2
26,510	-----	2,030	15	11	-----	4
49,820	-----	6,395	16	18	2	-----
9,380	-----	3,247	18	17	-----	1
64,810	-----	6,205	85	66	-----	19
59,038	-----	1,695	9	15	6	-----
139,100	-----	11,295	21	11	-----	10
26,465	-----	8,550	7	8	1	-----
76,741	-----	650	28	26	-----	2
89,025	3,050	-----	29	27	-----	2
8,405	185	-----	29	25	-----	4
116,875	-----	1,410	3	7	4	-----
38,035	7,310	-----	15	34	19	-----
15,063	1,943	-----	15	17	2	-----
22,615	-----	7,110	20	12	-----	8
31,620	-----	938	27	37	10	-----
24,656	-----	2,869	17	9	-----	8

No. 4—Continued.

COUNTIES.	Mules, 1876.	Mules, 1877.	Increase.	Decrease.	Value of mules, 1876.
Laurel	434	427		7	\$21,400
Lawrence	197	216	19		1,327
Lee	113	118	5		5,601
Letcher	169	212	43		9,541
Lewis	515	456		59	20,657
Lincoln	1,408	1,234		174	60,345
Livingston	1,336	1,365	29		95,580
Logan	3,083	3,337	254		136,205
Lyon	787	839	52		50,940
Madison	2,749	3,466	717		105,680
Magoffin	329	301		28	14,435
Marion	1,780	1,591		189	57,880
Marshall	1,475	1,585	110		90,082
Martin	54	69	15		3,145
Mason	1,322	1,128		194	46,529
McCracken	1,299	1,360	61		70,160
McLean	646	745	99		43,995
Meade	834	875	41		42,021
Menifee	82	102	20		2,570
Mercer	1,198	870		328	41,230
Metcalfe	749	789	40		37,153
Monroe	816	880	64		38,600
Montgomery	779	926	147		27,352
Morgan	502	490		12	20,680
Muhlenburg	1,670	1,692	22		87,491
Nelson	1,579	1,476		103	57,625
Nicholas	1,093	1,011		82	37,180
Ohio	235	1,307	1,072		66,297
Oldham	527	577	50		23,025
Owen	860	596		264	24,237
Owsley	250	243		7	13,820
Pendleton	608	493		115	25,875
Perry	179	191	12		10,165
Pike	308	400	92		21,475
Powell	160	178	18		6,145
Pulaski	1,655	1,745	90		71,026
Robertson	215	155		60	6,105
Rockcastle	447	415		32	20,035
Rowan	145	134		11	5,785
Russell	500	543	43		22,947
Scott	1,656	1,487		169	65,965
Shelby	1,294	1,024		270	57,895
Simpson	1,499	1,496		3	70,915
Spencer	821	670		151	22,323
Taylor	700	793	93		31,923
Todd	2,248	2,464	216		123,265
Trigg	2,206	2,352	146		142,070
Trimble	325	299		26	14,335
Union	1,869	1,848		21	87,572
Warren	3,000	3,096	96		154,610
Washington	873	789		84	26,870
Wayne	437	505	68		23,965
Webster	1,232	1,349	117		71,135
Whitley	687	707	20		36,180
Wolfe	182	177		5	7,795
Woodford	1,413	1,322		91	54,170
Total	117,289	120,435	7,788	4,642	\$5,783,873

No. 4—Continued.

Value of mules, 1877.	Increase.	Decrease.	Jennies, 1876.	Jennies, 1877.	Increase.	Decrease.
\$20,375		\$1,025	45	45		
12,745	\$1,418		17	18	1	
6,010	409		7	7		
11,680	2,139		15	15		
18,604		2,053	30	32	2	
51,405		8,940	49	22		27
91,300		4,280	13	19	6	
133,658		2,547	60	49		11
48,205		2,735	13	15	2	
97,770		7,910	94	68		26
13,760		675	12	11		1
50,780		7,100	36	53	17	
86,622		3,460	35	35		
3,790	645		4	9	5	
43,235		3,294	10	6		4
75,660	5,500		21	35	14	
46,685	2,690		9	10	1	
40,860		1,161	8	10	2	
3,520	950		6	4		2
34,660		6,570	16	14		2
36,903		250	32	32		
40,120	1,520		50	47		3
23,945		3,407	24	34	10	
21,860	1,180		12	25	13	
88,162	671		43	37		6
59,155	1,530		49	42		7
35,760		1,420	2	2		
68,405	2,108		30	25		5
21,890		1,135	14	17	3	
19,734		4,503	21	13		8
13,830	10		11	13	2	
20,745		5,130	21	18		3
11,081	916		20	23	3	
24,990	3,515		11	7		4
6,620	475		1	2	1	
71,901	875		107	94		13
4,415		1,690	11	4		7
19,560		475	29	24		5
5,625		160	13	11		2
25,375	2,428		41	44	3	
56,900		9,065	60	54		6
43,517		14,378	15	9		6
65,049		5,866	26	37	11	
15,200		7,123	10	3		7
34,164	2,241		40	38		2
130,615	7,350		29	14		15
134,657		7,413	29	27		2
13,055		1,280	19	14		5
75,210		12,362	35	34		1
151,120		3,490	37	34		3
25,624		1,246	4	5	1	
22,472		1,493	55	32		23
71,861	726		23	32	9	
35,130		1,050	55	44		11
7,950	155		10	11	1	
51,025		3,145	14	9		5
\$5,599,108	\$104,236	\$289,001	2,942	2,654	218	506

No. 4—Continued.

COUNTIES.	Value of jennies, 1876.	Value of jennies, 1877.	Increase.	Decrease.	Cattle, 1876.
Adair	\$3,732	\$3,262		\$470	4,432
Allen	636	395		241	4,182
Anderson	1,580	1,230		350	2,181
Ballard	1,240	935		305	4,343
Barren	485	80		405	5,177
Bath	1,685	1,160		525	8,186
Bell	370	465	\$95		3,019
Boone	1,410	745		665	6,221
Bourbon	3,280	2,115		1,165	12,754
Boyd	190	145		45	3,450
Boyle	1,050	950		100	4,381
Bracken	370	115		255	4,446
Breathitt	827	650		177	4,591
Breckinridge	1,095	1,275	180		3,789
Bullitt	1,525	1,056		469	2,875
Butler	995	825		170	4,903
Caldwell	695	866	171		1,601
Calloway	375	1,955	1,580		4,349
Campbell	780	430		350	2,612
Carroll					2,378
Carter	1,310	492		818	3,643
Casey	2,715	1,297		1,418	4,111
Christian	1,180	1,915	735		4,056
Clark	120	305	185		13,465
Clay	1,217	725		492	5,967
Clinton	795	640		155	3,235
Crittenden	815	540		275	3,392
Cumberland	260	275	15		2,340
Daviess	495	465		30	7,205
Edmonson	440	405		35	2,876
Estill	395	230		165	4,210
Elliott	852	825		27	3,354
Fayette	350	550	200		8,841
Fleming	300	85		215	6,519
Floyd	787	796	9		5,984
Franklin	1,615	1,955	340		3,661
Fulton	845	1,230	385		8,536
Gallatin	35			35	4,410
Garrard	900	410		490	7,614
Grant	1,180	990		190	5,865
Graves	2,520	1,595		925	7,152
Grayson	2,020	1,610		410	6,966
Green	780	250		530	1,969
Greenup	960	760		200	3,939
Hancock	755	350		405	1,378
Hardin	655	745	90		5,957
Harlan	425	265		160	4,901
Harrison	6,645	5,195		1,450	8,543
Hart	235	360	125		6,139
Henderson	633	465		168	4,003
Henry	590	370		220	5,097
Hickman	1,760	1,020		740	3,016
Hopkins	825	675		150	6,870
Jackson	640	540		100	2,626
Jefferson	235	555	320		5,982
Jessamine	600	1,850	1,250		4,067
Johnson	728	560		168	3,990
Kenton	490	575	85		4,178
Knox	1,060	1,573	513		4,050
Larue	520	175		345	2,082

No. 4—Continued.

Cattle, 1877.	Increase.	Decrease.	Value of cat- tle over \$50, 1876.	Value of cat- tle over \$50, 1877.	Increase.	Decrease.
4,744	312	-----	\$17,026	\$14,577	-----	\$2,449
5,229	1,047	-----	15,943	15,089	-----	854
2,661	480	-----	38,450	39,445	\$995	-----
4,314	-----	29	13,122	12,562	-----	560
4,932	-----	245	24,269	22,838	-----	1,431
6,400	-----	1,786	80,345	68,110	-----	12,235
3,122	103	-----	7,004	9,339	2,335	-----
6,458	237	-----	93,625	81,035	-----	12,590
13,347	593	-----	361,378	386,489	25,111	-----
3,653	203	-----	22,356	21,475	-----	881
3,705	-----	676	73,830	68,710	-----	5,120
4,204	-----	242	19,030	15,610	-----	3,420
4,949	358	-----	18,912	21,037	2,125	-----
3,510	-----	279	34,465	32,330	-----	2,135
3,540	665	-----	26,474	28,255	1,781	-----
4,399	-----	504	20,753	20,424	-----	329
1,378	-----	223	16,945	22,047	5,102	-----
5,040	691	-----	4,550	4,340	-----	210
1,705	-----	907	30,502	32,412	1,910	-----
2,136	-----	242	31,350	29,630	-----	1,720
3,558	-----	85	27,586	25,449	-----	2,137
2,878	-----	1,233	22,364	20,245	-----	2,119
1,187	-----	2,869	13,331	12,250	-----	1,081
12,681	-----	784	341,010	314,165	-----	26,845
6,169	202	-----	27,129	30,199	3,070	-----
3,150	-----	85	8,305	8,770	465	-----
4,825	1,433	-----	11,057	12,355	1,298	-----
3,057	717	-----	11,724	9,967	-----	1,757
3,910	-----	3,295	49,093	27,075	-----	22,018
2,793	-----	83	13,886	12,296	-----	1,590
4,261	51	-----	26,301	24,894	-----	1,407
3,152	-----	202	14,004	13,228	-----	776
9,502	661	-----	206,300	243,665	37,365	-----
5,407	-----	1,112	88,288	71,563	-----	16,725
6,612	628	-----	19,071	22,164	3,093	-----
3,894	233	-----	81,160	83,681	2,521	-----
4,499	-----	4,037	17,850	10,570	-----	7,280
6,235	1,825	-----	49,262	45,616	-----	3,646
7,749	135	-----	105,125	90,080	-----	15,045
5,796	-----	69	133,707	137,779	4,072	-----
5,930	-----	1,222	9,877	7,499	-----	2,378
5,868	-----	1,098	23,925	22,085	-----	1,840
1,822	-----	147	16,385	13,810	-----	2,575
3,342	-----	597	40,499	32,697	-----	7,802
1,137	-----	241	9,295	8,495	-----	800
5,799	-----	158	24,520	25,016	496	-----
4,215	-----	686	8,406	8,879	473	-----
8,275	-----	268	135,365	128,820	-----	6,545
5,996	-----	143	18,213	16,656	-----	1,557
3,343	-----	660	20,530	16,238	-----	4,292
4,610	-----	487	81,640	65,964	-----	15,676
2,565	-----	451	18,221	16,938	-----	1,283
6,992	122	-----	7,489	6,300	-----	1,189
2,902	276	-----	7,970	9,240	1,270	-----
7,164	1,182	-----	103,490	70,970	-----	32,520
9,225	5,158	-----	70,687	102,859	32,172	-----
4,223	233	-----	15,422	17,784	2,362	-----
4,216	38	-----	61,960	55,130	-----	6,830
4,836	786	-----	11,320	12,502	1,182	-----
1,666	-----	416	21,039	16,598	-----	4,441

No. 4—Continued.

COUNTIES.	Value of jennies, 1876.	Value of jennies, 1877.	Increase.	Decrease.	Cattle, 1876.
Laurel -----	\$1,895	\$1,428		\$467	3,588
Lawrence -----	650	612		38	6,019
Lee -----	220	180		40	1,865
Letcher -----	395	356		39	3,997
Lewis -----	1,612	985		627	4,763
Lincoln -----	1,775	1,350		425	8,596
Livingston -----	258	365	\$107		4,440
Logan -----	4,325	2,945		1,380	9,528
Lyon -----	230	352	122		2,340
Madison -----	2,950	2,020		830	14,548
Magoffin -----	420	227		193	2,442
Marion -----	715	685		30	5,114
Marshall -----	1,215	630		685	4,125
Martin -----	195	408	213		1,455
Mason -----	165	210	45		4,475
McCracken -----	995	1,380	385		2,182
McLean -----	805	740		65	3,344
Meade -----	435	325		110	2,092
Menifee -----	115	90		25	1,238
Mercer -----	620	570		50	3,382
Metcalfe -----	1,484	1,365		119	3,373
Monroe -----	2,085	2,115	30		5,062
Montgomery -----	1,145	495		650	7,420
Morgan -----	245	550	305		4,972
Muhlenburg -----	3,395	2,745		650	5,236
Nelson -----	2,655	2,130		525	6,623
Nicholas -----	100	100			5,001
Ohio -----	1,145	720		425	8,392
Oldham -----	1,745	1,490		255	3,624
Owen -----	1,045	600		445	3,917
Owsley -----	325	362	37		2,533
Pendleton -----	455	320		135	6,065
Perry -----	505	392		113	4,087
Pike -----	465	280		185	4,531
Powell -----	50	87	37		1,693
Pulaski -----	4,873	3,354		1,519	8,919
Robertson -----	675	135		540	1,834
Rockcastle -----	935	605		330	4,284
Rowan -----	440	350		90	1,653
Russell -----	2,605	2,275		330	3,744
Scott -----	3,775	2,650		1,125	7,147
Shelby -----	395	350		45	9,221
Simpson -----	1,660	2,600	940		1,353
Spencer -----	571	200		371	3,350
Taylor -----	1,752	1,278		474	3,228
Todd -----	890	485		405	2,793
Trigg -----	1,220	1,535	315		4,179
Trimble -----	1,475	770		705	3,003
Union -----	1,760	1,380		380	4,418
Warren -----	1,955	1,780		175	8,521
Washington -----	260	275	15		3,655
Wayne -----	2,121	1,022		1,099	8,021
Webster -----	650	910	260		2,883
Whitley -----	2,095	1,400		695	6,660
Wolfe -----	365	280		85	2,667
Woodford -----	1,125	600		525	4,618
Total -----	\$130,433	\$106,115	\$9,089	\$33,407	550,272

No. 4—Continued.

Cattle, 1877.	Increase.	Decrease.	Value of cat- tle over \$50, 1876.	Value of cat- tle over \$50, 1877.	Increase.	Decrease.
4,152	564	-----	\$10,891	\$14,675	\$3,784	-----
6,082	63	-----	32,709	37,355	4,646	-----
1,884	19	-----	11,014	11,435	421	-----
4,178	181	-----	9,861	10,030	169	-----
5,624	861	-----	40,627	37,579	-----	\$3,048
7,343	-----	1,253	143,570	126,436	-----	17,134
4,003	-----	437	19,575	17,220	-----	2,355
10,421	893	-----	24,135	28,086	3,951	-----
2,502	162	-----	13,003	14,327	1,324	-----
13,540	-----	1,008	269,160	217,250	-----	51,910
3,801	1,359	-----	16,895	18,379	1,484	-----
5,422	308	-----	28,955	30,440	1,485	-----
3,423	-----	702	5,665	4,775	-----	890
1,520	65	-----	6,329	6,750	421	-----
5,901	1,426	-----	78,835	65,995	-----	12,840
318	-----	1,864	2,750	3,530	780	-----
3,380	36	-----	9,909	8,358	-----	1,551
2,347	255	-----	29,879	37,583	7,704	-----
1,282	44	-----	3,584	3,322	-----	262
3,166	-----	216	68,412	61,092	-----	7,320
3,615	242	-----	10,581	9,233	-----	1,348
5,066	4	-----	13,875	12,644	-----	1,231
7,374	-----	46	109,369	92,065	-----	17,304
5,076	104	-----	23,989	24,740	751	-----
5,381	145	-----	8,009	10,970	2,961	-----
7,126	503	-----	107,745	96,860	-----	10,885
4,489	-----	512	73,990	62,490	-----	11,500
8,857	465	-----	26,447	25,615	-----	832
3,437	-----	187	51,729	46,786	-----	4,949
3,319	-----	598	47,964	43,578	-----	4,386
2,538	5	-----	11,753	12,915	1,162	-----
5,047	-----	1,018	43,445	35,725	-----	7,720
4,529	442	-----	11,910	13,453	1,543	-----
4,554	23	-----	38,185	39,950	1,765	-----
1,570	-----	123	11,853	10,934	-----	919
9,343	424	-----	36,117	36,114	-----	3
1,989	155	-----	19,350	18,595	-----	755
4,457	173	-----	25,585	26,980	1,395	-----
1,704	51	-----	11,672	10,226	-----	1,446
3,836	92	-----	13,132	15,592	2,460	-----
6,906	-----	241	177,200	174,950	-----	2,250
9,061	-----	160	148,454	151,499	3,045	-----
123	-----	1,230	6,220	4,470	-----	1,750
3,092	-----	258	56,043	49,960	-----	6,083
3,168	-----	60	10,080	10,512	432	-----
2,731	-----	62	8,560	8,720	160	-----
3,668	-----	511	17,070	14,831	-----	2,239
2,756	-----	247	34,920	33,500	-----	1,420
3,983	-----	435	32,533	24,835	-----	7,698
8,396	-----	125	45,310	42,703	-----	2,607
2,201	-----	454	58,889	51,437	-----	7,452
7,656	-----	365	49,679	45,122	-----	4,557
1,252	-----	1,631	5,814	6,575	761	-----
6,711	51	-----	25,690	20,905	-----	4,785
2,572	-----	95	11,649	21,422	9,773	-----
4,147	-----	471	142,190	141,310	-----	880
537,886	27,484	39,870	\$5,275,894	\$5,019,072	\$181,575	\$438,397

No. 4—Continued.

COUNTIES.	Stores, 1876.	Stores, 1877.	Increase.	Decrease.	Value of stores, 1876.	Value of stores, 1877.
Adair	21	24	3		\$41,647	\$44,760
Allen	24	23		1	24,825	29,555
Anderson	33	42	9		49,850	47,360
Ballard	37	42	5		46,850	57,500
Barren	57	60	3		90,975	99,850
Bath	42	39		3	57,900	45,500
Bell	11	8		3	10,650	6,950
Boone	61	52		9	73,260	76,055
Bourbon	93	109	16		160,275	204,825
Boyd	92	90		2	139,965	129,652
Boyle	65	66	1		129,705	132,625
Bracken	69	62		7	88,560	79,525
Breathitt	9	9			10,450	12,700
Breckinridge	61	70	9		90,945	101,300
Bullitt	23	25	2		25,775	20,475
Butler	20	23	3		44,500	43,103
Caldwell	51	45		6	72,955	57,042
Calloway	40	37		3	79,705	64,475
Campbell	208	228	20		141,210	131,510
Carroll	54	58	4		68,650	70,690
Carter	30	24		6	54,250	42,129
Casey	22	21		1	22,193	22,905
Christian	118	120	2		165,380	160,655
Clark	64	60		4	76,920	79,970
Clay	16	16			15,850	13,900
Clinton	14	12		2	28,400	25,600
Crittenden	31	37	6		48,530	48,700
Cumberland	20	19		1	27,450	27,500
Daviess	168	177	9		234,245	247,775
Edmonson	14	14			10,401	7,820
Estill	30	27		3	28,955	30,050
Elliott	6	12	6		7,200	8,580
Fayette	289	269		20	629,100	552,300
Fleming	66	58		8	72,470	66,975
Floyd	13	17	4		16,455	18,640
Franklin	95	81		14	211,906	207,908
Fulton	71	72	1		156,400	151,685
Gallatin	28	31	3		44,605	45,200
Garrard	45	41		4	73,500	56,100
Grant	46	44		2	57,810	63,525
Graves	93	90		3	132,991	122,738
Grayson	51	56	5		50,190	49,765
Green	31	37	6		17,475	21,415
Greenup	36	32		4	64,960	60,800
Hancock	30	31	1		31,030	30,000
Hardin	96	89		7	99,600	119,774
Harlan	10	12	2		7,200	10,950
Harrison	75	91	16		116,660	114,980
Hart	42	36		6	77,985	65,150
Henderson	122	123	1		207,965	207,381
Henry	69	68		1	111,460	95,655
Hickman	58	60	2		68,085	81,469
Hopkins	77	80	3		85,161	85,315
Jackson	8	8			4,950	7,100
Jefferson	1,899	1,915	16		7,723,625	7,260,225
Jessamine	38	50	12		59,750	98,740
Johnson	20	19		1	29,173	24,404
Kenton	528	511		17	601,520	579,905
Knox	27	31	4		22,216	14,538
Larue	22	26	4		39,375	38,160

No. 4—Continued.

Increase.	Decrease.	Value under the equalization law, 1876.	Value under the equalization law, 1877.	Increase.	Decrease.
\$3,113		\$294,232	\$277,933		\$16,299
4,730		186,418	192,165	\$5,747	
	\$2,490	284,990	257,550		27,440
10,650		130,709	313,762	183,053	
8,875		298,228	298,082	854	
	12,400	357,660	314,375		43,285
	3,700	14,886	14,226		660
2,795		945,184	817,752		127,432
44,550		1,407,685	1,410,419	2,734	
	10,313	355,403	442,341	86,938	
2,920		1,087,135	977,017		110,118
	9,035	356,870	329,350		27,520
2,250		52,176	41,984		10,192
10,355		718,605	616,195		102,410
	5,300	281,087	233,754		47,333
	1,397	193,934	159,952		33,982
	15,913	267,179	283,970	16,791	
	15,230	260,751	237,285		23,466
	9,700	434,975	429,363		5,612
2,040		388,883	379,735		9,148
	12,121	128,745	76,987		51,758
712		114,645	102,319		12,326
	4,725	552,340	505,950		46,390
3,050		923,410	826,490		96,920
	1,950	85,218	92,058	6,840	
	2,800	102,691	92,405		10,286
170		239,337	234,213		5,124
50		187,759	170,421		17,338
13,530		692,945	737,988	45,043	
	2,581	82,653	86,999	4,346	
1,095		113,001	99,825		13,176
1,380		36,839	33,545		3,294
	76,800	2,185,420	2,044,222		141,198
	5,495	664,641	596,379		68,262
2,185		57,862	59,106	1,244	
	3,998	603,804	539,278		64,526
	4,715	273,589	221,193		52,396
595		174,731	192,266	17,535	
	17,400	439,612	350,300		89,312
5,715		366,892	366,683		209
	10,253	386,235	378,082		8,153
	425	271,115	244,705		26,410
3,940		156,028	135,050		20,978
	4,160	356,679	302,160		54,519
	1,030	171,480	150,955		20,525
20,174		459,982	359,828		110,154
3,750		37,816	34,812		3,004
	1,680	780,815	710,256		70,559
	12,835	371,052	311,274		59,778
	584	835,245	725,439		109,806
	15,805	489,955	633,753	143,798	
13,384		201,009	178,992		22,017
154		275,211	272,161		3,050
2,150		13,650	15,050	1,400	
	463,400	8,410,456	8,864,930	454,474	
38,990		519,000	672,560	153,560	
	4,769	70,787	72,714	1,927	
	21,615	988,120	1,107,887	119,767	
	7,678	110,817	97,285		13,532
	1,215	201,344	197,933		3,411

No. 4—Continued.

COUNTIES.	Stores, 1876.	Stores, 1877.	Increase.	Decrease.	Value of stores, 1876.	Value of stores, 1877.
Laurel	23	20		3	\$13,935	\$13,380
Lawrence	25	13		12	42,790	41,350
Lee	12	11		1	12,950	10,150
Letcher	14	11		3	14,615	8,935
Lewis	48	50	2		40,650	44,807
Lincoln	65	68	3		109,450	100,830
Livingston	38	39	1		41,730	42,645
Logan	90	107	17		86,173	78,595
Lyon	19	24	5		42,500	40,890
Madison	98	101	3		168,520	150,990
Magoffin	8	9	1		12,300	11,650
Marion	43	44	1		89,000	84,380
Marshall	31	33	2		29,350	31,905
Martin	8	8			5,075	4,610
Mason	174	152		22	406,870	320,335
McCracken	198	186		12	416,045	429,450
McLean	37	36		1	38,255	42,310
Meade	34	26		8	51,500	48,080
Menifee	6	14	8		3,210	3,270
Mercer	56	56			109,450	87,075
Metcalf	24	26	2		25,749	28,593
Monroe	25	29	4		39,950	40,720
Montgomery	54	57	3		79,250	72,200
Morgan	7	8	1		14,665	18,510
Muhlenburg	48	56	8		51,525	53,970
Nelson	75	71		4	111,125	100,000
Nicholas	37	41	4		59,990	52,170
Ohio	72	81	9		74,745	79,650
Oldham	28	27		1	28,380	29,750
Owen	41	54	13		54,183	61,000
Owsley	14	14			12,950	13,052
Pendleton	65	68	3		71,205	68,315
Perry	5	6	1		6,950	10,160
Pike	21	22	1		52,335	42,550
Powell	8	9	1		4,175	4,288
Pulaski	52	48		4	66,220	56,220
Robertson	16	13		3	9,425	7,850
Rockcastle	27	27			26,425	28,185
Rowan	10	4		6	6,075	3,700
Russell	14	15	1		24,750	27,900
Scott	73	67		6	120,575	96,025
Shelby	67	76	9		111,675	110,350
Simpson	54	52		2	72,460	72,870
Spencer	16	20	4		15,500	16,300
Taylor	21	18		3	27,505	22,474
Todd	54	77	23		100,970	94,950
Trigg	54	47		7	84,210	75,575
Trimble	18	17		1	22,800	15,500
Union	72	85	13		136,027	124,270
Warren	121	129	8		231,545	241,115
Washington	34	35	1		29,875	30,200
Wayne	20	20			38,922	30,450
Webster	38	45	7		59,750	48,020
Whitley	25	24		1	30,545	25,650
Wolfe	11	11			16,783	13,199
Woodford	59	54		5	102,200	99,025
Total	7,996	8,090	337	243	\$16,737,825	\$15,932,226

No. 4—Continued.

Increase.	Decrease.	Value under the equalization law, 1876.	Value under the equalization law, 1877.	Increase.	Decrease.
	\$555	\$118,014	\$90,880		\$27,134
	1,440	125,513	132,210	\$6,697	
	2,800	38,512	28,335		10,177
	5,680	35,260	30,096		5,164
\$4,157		225,118	194,017		31,101
	8,620	626,879	626,900	21	
915		226,738	186,119		40,619
	7,578	460,389	350,795		109,594
	1,610	137,352	136,430		922
	17,530	1,161,150	1,094,790		66,360
	650	76,473	75,803		670
	4,620	688,896	652,748		36,148
2,555		140,551	143,161	2,610	
	465	12,603	10,781		1,822
	86,535	1,020,100	906,605		113,495
13,405		1,357,435	329,020		1,028,415
4,055		165,977	149,115		16,862
	3,420	276,549	177,242		99,307
60		13,445	9,843		3,602
	22,375	484,354	486,199	1,845	
2,844		225,912	189,399		36,513
770		170,661	176,282	5,621	
	7,050	269,647	265,848		3,799
3,845		48,760	70,749	21,989	
2,445		177,315	163,749		13,566
	11,125	1,433,790	1,354,118		79,672
	7,820	529,570	461,810		67,760
4,905		369,636	337,694		31,942
1,370		351,030	392,400	41,370	
6,817		325,206	275,558		49,648
102		26,521	23,539		2,982
	2,890	239,380	237,639		1,741
3,210		24,110	25,904	1,794	
	9,785	98,755	119,660	20,905	
113		29,297	35,728	6,431	
	10,000	201,225	159,421		41,804
	1,575	67,540	56,920		10,620
1,760		135,248	116,932		18,316
	2,375	31,472	24,645		6,827
3,150		173,619	163,080		10,539
	24,550	686,650	646,550		40,100
	1,325	983,583	951,657		31,926
410		291,039	272,217		18,822
800		264,740	256,422		8,318
	5,031	179,047	188,352	9,305	
	6,020	504,896	498,423		6,473
	8,635	317,494	296,886		20,608
	7,300	170,545	151,650		18,895
	11,757	437,154	436,498		656
9,570		946,750	1,008,747	61,997	
325		371,064	374,576	3,512	
	8,472	209,033	221,093	12,060	
	11,730	219,630	201,520		18,110
	4,895	92,645	86,190		6,455
	3,584	96,122	65,040		31,082
	3,175	860,965	890,240	29,275	
\$270,885	\$1,076,484	\$50,411,279	\$47,930,888	\$1,471,483	\$3,951,874

No. 4—Continued.

COUNTIES.	Value of car- riages, &c., 1876.	Value of car- riages, &c., 1877.	Increase.	Decrease.	Value of gold and silver watches, gold and silver plate, pianos, &c., 1876.	Value of gold and silver watches, gold and silver plate, pianos, &c., 1877.
Auair	\$5,310	\$6,280	\$970		\$12,532	\$11,990
Allen	12,796	5,023		\$7,773	6,562	5,803
Anderson	11,560	13,140	1,580		6,320	6,380
Ballard	9,320	10,339	1,019		11,957	12,800
Barren	14,039	13,050		989	16,050	17,133
Bath	9,150	7,185		1,965	10,030	8,410
Bell	180	98		82	902	611
Boone	25,625	22,795		2,830	24,128	19,772
Bourbon	44,175	50,655	6,480		47,694	57,130
Boyd	10,417	9,335		1,082	44,233	38,808
Boyle	26,975	28,365	1,390		20,990	18,555
Bracken	23,285	22,176		1,109	18,255	18,507
Breathitt					1,009	1,028
Breckinridge	7,740	8,595	855		22,605	24,180
Bullitt	10,303	8,890		1,413	14,934	14,269
Butler	1,445	1,017		428	4,818	6,179
Caldwell	8,175	9,215	1,040		13,100	11,604
Calloway	10,722	10,205		517	12,042	12,210
Campbell	21,260	15,275		5,985	46,505	44,698
Carroll	9,535	9,030		505	15,132	16,267
Carter	1,405	970		435	6,834	6,670
Casey	5,293	4,472		821	4,479	3,244
Christian	45,310	40,215		5,095	40,705	43,715
Clark	13,230	14,820	1,590		14,337	16,725
Clay	2,311	40		2,271	4,867	4,273
Clinton	365	1,085	720		2,828	1,910
Crittenden	5,187	5,128		59	10,376	11,570
Cumberland	2,745	1,845		900	6,371	5,983
Daviess	42,600	42,315		285	40,239	40,388
Edmonson	2,183	988		1,197	2,566	2,393
Estill	2,185	2,240	55		5,017	4,569
Elliott					928	699
Fayette	56,275	52,175		4,100	66,440	61,130
Fleming	31,203	27,465		3,738	23,883	22,060
Floyd	360	230		130	2,117	2,071
Franklin	34,013	31,674		2,339	60,792	56,631
Fulton	10,360	10,460	100		15,330	12,645
Gallatin	4,175	4,415	240		12,795	10,819
Garrard	26,080	23,815		2,265	23,480	21,285
Grant	16,343	11,622		4,721	12,035	10,589
Graves	22,042	23,408	1,366		21,250	20,916
Grayson	2,695	1,820		875	9,557	8,725
Green	3,790	2,440		1,350	6,248	5,210
Greenup	6,422	5,580		842	14,951	13,830
Hancock	4,710	5,055	345		9,290	8,785
Hardin	13,560	11,925		1,635	19,985	15,971
Harlan	1,500			1,500	490	388
Harrison	23,855	21,475		2,380	33,145	33,140
Hart	6,725	9,450	2,725		11,083	12,979
Henderson	43,698	35,108		8,590	54,118	49,500
Henry	22,650	24,000	1,350		25,460	26,526
Hickman	7,326	6,352		974	13,006	12,551
Hopkins	8,980	10,035	1,055		15,615	14,735
Jackson					440	845
Jefferson	162,400	166,990	4,590		267,124	267,238
Jessamine	24,570	22,505		2,065	21,595	18,925
Johnson	470	215		255	3,765	3,898
Kenton	86,760	88,225	1,465		167,925	190,675
Knox	866	917	51		3,808	4,018
Larue	3,765	3,135		630	6,402	6,317

No. 4—Continued.

Increase.	Decrease.	Total valuation, 1876.	Total valuation, 1877.	Increase.	Decrease.
	\$542	\$1,822,089	\$1,834,482	\$12,393	
	759	1,685,730	1,639,575		\$46,155
\$60		1,798,000	1,736,705		61,295
843		2,228,088	2,456,797	228,709	
1,083		3,209,571	3,140,722		68,849
	1,620	2,754,610	2,533,500		221,110
	291	409,241	444,618	35,377	
	4,356	5,998,330	5,661,552		336,778
9,436		10,659,701	10,988,810	329,109	
	5,425	3,203,470	3,145,549		57,921
	2,435	4,668,672	4,556,299		112,373
252		3,279,720	3,176,844		102,876
19		684,866	654,743		30,123
1,575		3,606,462	3,498,774		107,688
	665	2,279,461	2,126,381		153,080
1,361		1,506,384	1,419,640		86,744
	1,496	2,036,407	1,944,449		91,958
1,168		2,102,880	2,003,566		99,314
	1,807	9,803,813	9,260,341		543,472
1,135		2,505,595	2,456,761		48,834
	164	1,735,486	1,460,367		275,119
	1,235	1,339,998	1,284,739		55,259
3,010		5,272,869	4,984,255		288,614
2,388		5,673,551	5,467,018		206,533
	594	957,608	1,046,924	89,316	
	918	848,843	862,315	13,472	
1,194		1,941,586	1,894,181		47,405
	388	1,305,040	1,265,863		39,177
149		6,999,382	6,919,446		79,936
	173	964,010	904,960		59,050
	448	1,263,399	1,158,525		104,874
	229	561,834	548,192		13,642
	5,310	14,343,670	13,928,519		415,151
	1,823	4,218,325	3,865,599		352,726
	46	868,782	930,378	61,596	
	4,161	5,042,122	4,823,694		218,428
	2,685	1,906,045	1,819,598		86,447
	1,985	1,731,175	1,664,854		66,321
	2,195	3,527,127	3,331,000		196,127
	1,446	3,118,518	3,172,757	54,239	
	334	4,063,702	3,822,681		241,021
	832	1,799,669	1,724,195		75,474
	1,038	1,204,900	1,132,939		71,961
	1,121	2,426,830	2,271,245		155,585
	505	1,526,550	1,461,495		65,055
	4,014	3,232,716	2,809,535		423,181
	102	611,848	523,966		87,882
	5	5,717,859	5,541,406		176,453
1,896		2,550,594	2,328,593		222,001
	4,618	5,986,340	5,542,492		443,848
1,066		4,275,440	4,265,820		9,620
	455	1,870,557	1,741,795		128,762
	880	2,485,194	2,367,832		117,362
405		450,630	430,595		20,035
114		65,562,248	63,312,568		2,249,680
	2,670	3,409,482	3,897,689	488,207	
133		821,723	833,846	12,123	
22,750		15,782,034	15,829,127	47,093	
210		895,974	896,780	806	
	85	1,696,491	1,698,094	1,603	

No. 4—Continued.

COUNTIES.	Value of carriages, &c., 1876.	Value of carriages, &c., 1877.	Increase.	Decrease.	Value of gold and silver watches, gold and silver plate, pianos, &c., 1876.	Value of gold and silver watches, gold and silver plate, pianos, &c., 1877.
Laurel	\$1,352	\$800		\$552	\$3,939	\$3,785
Lawrence	1,435	1,243		192	9,155	9,847
Lee					2,848	2,912
Letcher	1,193	125		1,068	924	1,022
Lewis	10,820	9,078		1,742	19,185	18,356
Lincoln	29,795	25,115		4,680	29,145	26,517
Livingston	4,575	4,370		205	15,514	14,901
Logan	20,620	20,315		305	22,710	20,363
Lyon	3,440	2,861		579	8,451	8,386
Madison	37,440	35,820		1,620	32,830	29,830
Magoffin		240	\$240		1,046	1,330
Marion	14,069	13,930		139	13,694	11,951
Marshall	4,887	5,057	170		7,959	8,090
Martin	50			50	823	580
Mason	43,645	43,430		215	50,090	44,645
McCracken	19,535	19,095		440	55,075	47,675
McLean	8,315	8,770	455		7,209	6,995
Meade	8,298	7,930		368	11,736	9,381
Menifee	55	195	140		358	689
Mercer	25,370	21,235		4,135	21,635	17,786
Metcalfe	3,791	3,470		321	7,621	7,419
Monroe	1,610	1,530		80	3,850	3,060
Montgomery	12,740	9,570		3,170	15,748	16,177
Morgan	410	480	70		3,058	2,749
Muhlenburg	7,760	6,362		1,398	12,468	12,856
Nelson	24,810	24,735		75	45,125	45,789
Nicholas	12,230	13,140	910		14,720	14,330
Ohio	10,940	9,860		1,080	14,908	15,705
Oldham	10,840	10,330		510	17,900	16,790
Owen	7,480	6,435		1,045	8,586	8,516
Owsley	100	25		75	1,242	1,807
Pendleton	3,540	5,265	1,725		15,730	15,345
Perry		3	3		214	111
Pike	665	745	80		5,196	3,606
Powell	338			338	379	273
Pulaski	4,102	3,170		932	10,900	8,250
Robertson	2,900	3,380	480		4,570	4,015
Rockcastle	350	325		25	4,791	4,140
Rowan	956	330		626	1,296	1,306
Russell	1,183	1,185	2		2,305	2,598
Scott	36,725	37,215	490		32,810	33,030
Shelby	52,730	50,230		2,500	36,137	31,894
Simpson	19,490	22,546	3,056		13,659	14,572
Spencer	10,729	8,360		2,429	9,938	8,137
Taylor	5,241	5,300	59		7,708	7,185
Todd	26,942	26,925		17	17,813	17,950
Trigg	14,008	11,862		2,146	16,060	13,493
Trimble	6,350	6,160		190	13,255	12,575
Union	23,445	18,920		4,525	30,178	26,470
Warren	27,315	26,305		1,010	43,615	37,804
Washington	8,110	6,245		1,865	8,145	8,787
Wayne	1,560	6,440	4,880		2,670	3,277
Webster	9,840	8,755		1,085	9,995	8,146
Whitley	335	415	80		1,225	1,120
Wolfe	320	570	250		2,419	2,133
Woodford	35,210	31,075		4,135	38,365	33,550
Total	\$1,630,408	\$1,552,487	\$42,076	\$119,997	\$2,200,393	\$2,131,872

No. 4—Continued.

Increase.	Decrease.	Total valuation, 1876.	Total valuation, 1877.	Increase.	Decrease.
	\$154	\$845,621	\$820,857		\$24,764
\$692		1,414,355	1,474,019	\$59,664	
64		511,241	483,705		27,536
98		500,880	498,947		1,933
	829	2,276,759	2,210,223		66,536
	2,628	4,225,634	4,169,712		55,922
	613	1,729,084	1,649,283		79,801
	2,347	3,984,699	3,751,088		233,611
	65	1,127,892	1,072,212		55,680
	3,000	7,571,300	7,369,580		201,720
284		736,147	700,451		35,696
	1,743	3,388,257	3,352,189		36,068
131		1,545,417	1,467,353		78,064
	243	267,466	294,786	27,320	
	5,445	7,802,296	7,434,928		367,368
	7,400	6,225,315	4,903,100		1,322,215
	214	1,535,992	1,552,798	16,806	
	2,355	2,029,173	1,915,495		113,678
331		214,156	209,353		4,803
	3,849	3,840,438	3,521,583		318,855
	202	1,417,998	1,337,161		80,837
	790	1,381,129	1,355,879		25,250
429		3,311,043	3,232,594		78,449
	309	1,005,607	968,905		36,702
388		2,026,796	1,955,029		71,767
664		5,380,875	5,114,987		265,888
	396	3,255,020	3,114,490		140,530
797		3,093,425	2,992,469		100,956
	1,110	2,894,858	2,880,443		14,415
	70	2,707,741	2,547,925		159,816
565		499,242	494,515		4,727
	385	3,105,880	3,059,669		46,211
	103	511,639	506,323		5,316
	1,584	1,478,543	1,502,661	24,118	
	106	367,053	389,896	22,843	
	2,650	2,108,414	1,959,255		149,159
	555	943,685	877,175		66,510
	651	948,734	913,412		35,322
10		479,115	455,435		23,680
293		1,106,525	1,110,833		15,692
220		6,267,050	6,145,320		121,730
	4,243	7,808,420	7,635,560		172,860
913		2,280,573	2,154,095		126,478
	1,801	2,086,770	1,976,964		109,806
	523	1,277,601	1,253,807		23,794
137		2,794,703	2,767,583		27,120
	2,567	2,363,265	2,328,594		34,671
	680	1,801,365	1,673,895		127,470
	3,708	3,635,693	3,256,452		379,241
	5,811	6,687,155	6,470,649		216,506
642		2,504,013	2,493,359		10,654
607		1,620,501	1,611,257		9,244
	1,849	1,859,759	1,777,157		82,602
	105	1,016,375	986,175		30,200
	286	562,683	567,526	4,843	
	4,815	5,919,875	5,847,640		72,235
\$57,512	\$126,033	\$396,534,486	\$383,012,736	\$1,529,637	\$15,051,387

No. 4—Continued.

COUNTIES.	Tax at 40 cents on the \$100, 1876.	Tax at 40 cents on the \$100, 1877.	Increase.	Decrease.	Auditor's list, 1876.	Auditor's list, 1877.
Adair	\$7,288 36	\$7,337 93	\$49 57			
Allen	6,742 92	6,558 30		\$184 62		
Anderson	7,192 00	6,946 82		245 18		
Ballard	8,912 35	9,827 19	914 84			
Barren	12,838 28	12,562 89		275 39		
Bath	11,018 45	10,134 00		884 45		
Bell	1,636 96	1,778 47	141 51			
Boone	23,993 32	22,646 21		1,347 11		
Bourbon	42,638 80	43,955 24	1,316 44			
Boyd	12,813 88	12,582 20		231 68		
Boyle	18,674 69	18,225 20		449 49		
Bracken	13,118 88	12,707 38		411 50		
Breathitt	2,739 46	2,618 97		120 49		
Breckinridge	14,425 85	13,995 10		430 75		
Bullitt	9,117 84	8,505 52		612 32		
Butler	6,025 54	5,678 56		346 98		
Caldwell	8,145 63	7,777 80		367 83		
Calloway	8,411 52	8,014 25		397 27		
Campbell	39,215 25	37,041 36		2,173 89		
Carroll	10,022 38	9,827 04		195 34		
Carter	6,941 94	5,841 47		1,109 47		
Casey	5,359 99	5,138 96		221 03		
Christian	21,091 48	19,937 02		1,154 46		
Clark	22,694 20	21,868 07		826 13		
Clay	3,830 43	4,187 70	357 27			
Clinton	3,395 37	3,449 26	53 89			
Crittenden	7,766 34	7,576 72		189 62		
Cumberland	5,220 16	5,063 45		156 71		
Daviess	27,997 53	27,677 78		319 75		
Edmonson	3,856 05	3,619 84		236 21		
Estill	5,053 60	4,634 10		419 50		
Elliott	2,247 34	2,192 77		54 57		
Fayette	57,374 68	55,714 08		1,660 60		
Fleming	16,873 30	15,462 39		1,410 91		
Floyd	3,475 13	3,721 51	246 38			
Franklin	20,168 49	19,294 78		873 71		
Fulton	7,624 18	7,278 39		345 79		
Gallatin	6,924 70	6,659 42		265 28		
Garrard	14,108 50	13,324 00		784 50		
Grant	12,474 07	12,691 03	216 96			
Graves	16,254 80	15,290 72		964 08		
Grayson	7,198 68	6,896 78		301 90		
Green	4,819 60	4,531 76		287 84		
Greenup	9,707 32	9,084 98		622 34		
Hancock	6,106 20	5,845 98		260 22		
Hardin	12,930 86	11,238 14		1,692 72		
Harlan	2,447 39	2,095 86		351 53		
Harrison	22,871 44	22,165 62		705 82		
Hart	10,202 38	9,314 37		888 01		
Henderson	23,945 36	22,169 97		1,775 39		
Henry	17,101 76	17,063 28		38 48		
Hickman	7,482 23	6,967 18		515 05		
Hopkins	9,940 78	9,471 33		469 45		
Jackson	1,802 52	1,722 38		80 14		
Jefferson	262,248 99	253,250 27		8,998 72		
Jessamine	13,637 93	15,590 76	1,952 83			
Johnson	3,286 89	3,335 38	48 49			
Kenton	63,128 13	63,316 51	188 38			
Knox	3,583 90	3,587 12	3 22			
Larue	6,785 96	6,792 38	6 42			

No. 4—Continued.

Increase.	Decrease.	Total tax for 1876.	Total tax for 1877.	Increase.	Decrease.
		\$7,288 36	\$7,337 93	\$49 57	
		6,742 92	6,558 30		\$184 62
		7,192 00	6,946 82		245 18
		8,912 35	9,827 19	914 18	
		12,838 28	12,562 89		275 39
		11,018 45	10,134 00		884 45
		1,636 96	1,778 47	141 51	
		23,993 32	22,646 21		1,347 11
		42,638 80	43,955 24	1,316 44	
		12,813 88	12,582 20		231 68
		18,674 69	18,225 20		449 49
		13,118 88	12,707 38		411 50
		2,739 46	2,618 97		120 49
		14,425 85	13,995 10		430 75
		9,117 84	8,505 52		612 32
		6,025 54	5,678 56		346 98
		8,145 63	7,777 80		367 83
		8,411 52	8,014 25		397 27
		39,215 25	37,041 36		2,173 89
		10,022 38	9,827 04		195 34
		6,941 94	5,841 47		1,100 47
		5,359 99	5,138 96		221 03
		21,091 48	19,937 02		1,154 46
		22,694 20	21,868 07		826 13
		3,830 43	4,187 70	357 27	
		3,395 37	3,449 26	53 89	
		7,766 34	7,576 72		189 62
		5,220 16	5,063 45		156 71
		27,997 53	27,677 78		319 75
		3,856 05	3,619 84		236 21
		5,053 60	4,634 10		419 50
		2,247 34	2,192 77		54 57
		57,374 68	55,714 08		1,660 60
		16,873 30	15,462 39		1,410 91
		3,475 13	3,721 51	246 38	
		20,168 49	19,294 78		873 71
		7,624 18	7,278 39		345 79
		6,924 70	6,659 42		265 28
		14,108 50	13,324 00		784 50
		12,474 07	12,691 03	216 96	
		16,254 80	15,290 72		964 08
		7,198 68	6,896 78		301 90
		4,819 60	4,531 76		287 84
		9,707 32	9,084 98		622 34
		6,106 20	5,845 98		260 22
		12,930 86	11,238 14		1,692 72
		2,447 39	2,095 86		351 53
		22,871 44	22,165 62		705 82
		10,202 38	9,314 37		888 01
		23,945 36	22,169 97		1,775 39
		17,101 76	17,063 28		38 48
		7,482 23	6,967 18		515 05
		9,946 78	9,471 33		469 45
		1,802 52	1,722 38		80 14
		262,248 99	253,250 27		8,998 72
		13,637 93	15,590 76	1,952 83	
		3,286 89	3,335 38	48 49	
		63,128 13	63,316 51	188 38	
		3,583 90	3,587 12	3 22	
		6,785 96	6,792 38	6 42	

No. 4—Continued.

COUNTIES.	Tax at 40 cents on the \$100, 1876.	Tax at 40 cents on the \$100, 1877.	Increase.	Decrease.	Auditor's list, 1876.	Auditor's list, 1877.
Laurel	\$3,382 48	\$3,283 43		\$99 05		
Lawrence	5,657 42	5,896 08	\$238 66			
Lee	2,044 97	1,934 82		110 15		
Letcher	2,003 52	1,995 79		7 73		
Lewis	9,107 04	8,840 89		266 15		
Lincoln	16,902 52	16,678 85		223 67		
Livingston	6,916 34	6,597 13		319 21		
Logan	15,938 80	15,004 35		934 45		
Lyon	4,511 57	4,288 85		222 72		
Madison	30,285 20	29,478 32		806 88		
Magoffin	2,944 59	2,801 80		142 79		
Marion	13,553 03	13,408 76		144 27		
Marshall	6,181 67	5,869 41		312 26		
Martin	1,069 86	1,179 15	109 29			
Mason	31,209 18	29,739 71		1,469 47		
McCracken	24,901 26	19,612 40		5,288 86		
McLean	6,143 97	6,211 19	67 22			
Meade	8,116 69	7,661 98		454 71		
Menifee	856 63	837 41		19 22		
Mercer	15,361 75	14,086 33		1,275 42		
Metcalfe	5,671 99	5,348 64		323 35		
Monroe	5,524 52	5,423 52		101 00		
Montgomery	13,244 17	12,930 38		313 79		
Morgan	4,022 43	3,875 62		146 81		
Muhlenburg	8,107 18	7,820 12		287 06		
Nelson	21,523 50	20,459 95		1,063 55		
Nicholas	13,020 08	12,457 95		562 13		
Ohio	12,373 70	11,969 88		403 82		
O'dham	11,579 43	11,521 77		57 66		
Owen	10,830 96	10,191 70		639 26		
Owsley	1,996 97	1,978 06		18 91		
Pendleton	12,423 52	12,238 68		184 84		
Perry	2,046 55	2,025 29		21 26		
Pike	5,914 17	6,010 64	96 47			
Powell	1,468 21	1,559 58	91 37			
Pulaski	8,433 66	7,837 02		596 64		
Robertson	3,774 74	3,508 70		266 04		
Rockcastle	3,794 94	3,653 65		141 29		
Rowan	1,916 46	1,821 74		94 72		
Russell	4,506 10	4,443 33		62 77		
Scott	25,068 20	24,581 28		486 92		
Shelby	31,233 68	30,542 24		691 44		
Simpson	9,122 29	8,616 38		505 91		
Spencer	8,347 08	7,907 86		439 22		
Taylor	5,110 40	5,015 23		95 17		
Todd	11,178 82	11,070 33		108 49		
Trigg	9,453 06	9,314 38		138 68		
Trimble	7,205 46	6,695 58		509 88		
Union	14,542 77	13,025 80		1,516 97		
Warren	26,748 62	25,882 60		866 02		
Washington	10,016 06	9,973 43		42 63		
Wayne	6,482 00	6,445 03		36 97		
Webster	7,439 04	7,108 63		330 41		
Whitley	4,065 50	3,944 70		120 80		
Wolfe	2,250 73	2,270 10	19 37			
Woodford	23,679 50	23,390 56		288 94		
Total	\$1,586,137 94	\$1,532,050 94	\$6,118 58	\$60,205 58		

No. 4—Continued.

Increase.	Decrease.	Total tax for 1876.	Total tax for 1877.	Increase.	Decrease.
		\$3,382 48	\$3,233 43		\$99 05
		5,657 42	5,896 08	\$238 66	
		2,044 97	1,934 82		110 15
		2,003 52	1,995 79		7 73
		9,107 04	8,840 89		266 15
		16,902 52	16,678 85		223 67
		6,916 34	6,597 13		319 21
		15,938 80	15,004 35		934 45
		4,511 57	4,288 85		222 72
		30,285 20	29,478 32		806 88
		2,944 59	2,801 80		142 79
		13,553 03	13,408 76		144 27
		6,181 67	5,869 41		312 26
		1,069 86	1,179 15	109 29	
		31,209 18	29,739 71		1,469 47
		24,901 26	19,612 40		5,288 86
		6,143 97	6,211 19	67 22	
		8,116 69	7,661 98		454 71
		856 63	837 41		19 22
		15,361 75	14,086 33		1,275 42
		5,671 99	5,348 64		323 35
		5,524 52	5,423 52		101 00
		13,244 17	12,930 38		313 79
		4,022 43	3,875 62		146 81
		8,107 18	7,820 12		287 06
		21,523 50	20,459 95		1,063 55
		13,020 08	12,457 95		562 13
		12,373 70	11,969 88		403 82
		11,579 43	11,521 77		57 66
		10,830 96	10,191 70		639 26
		1,996 97	1,978 06		18 91
		12,423 52	12,238 68		184 84
		2,046 55	2,025 29		21 26
		5,914 17	6,010 64	96 47	
		1,468 21	1,559 58	91 37	
		8,433 66	7,837 02		596 64
		3,774 74	3,508 70		266 04
		3,794 94	3,653 65		141 29
		1,916 46	1,821 74		94 72
		4,506 10	4,443 33		62 77
		25,068 20	24,581 28		486 92
		31,233 68	30,542 24		691 44
		9,122 29	8,616 38		505 91
		8,347 08	7,907 86		439 22
		5,110 40	5,015 23		95 17
		11,178 82	11,070 33		108 49
		9,453 06	9,314 38		138 68
		7,205 46	6,695 58		509 88
		14,542 77	13,025 80		1,516 97
		26,748 62	25,882 60		866 02
		10,016 06	9,973 43		42 63
		6,482 00	6,445 03		36 97
		7,439 04	7,108 63		330 41
		4,065 50	3,944 70		120 80
		2,250 73	2,270 10	19 37	
		23,679 50	23,390 56		288 94
		\$1,586,137 94	\$1,532,050 94	\$6,118 58	\$60,205 58

No. 4—Continued.

COUNTIES.	White males over 21 years of age, 1876.	White males over 21 years of age, 1877.	Increase.	Decrease.	Legal voters, white, 1876.
Adair	2,174	2,249	75		2,176
Allen	2,109	2,175	66		2,143
Anderson	1,619	1,669	50		1,638
Ballard	2,454	2,629	175		2,394
Barren	3,442	3,540	98		3,454
Bath	1,960	2,133	173		1,995
Bell	841	944	103		896
Boone	2,689	2,679		10	2,562
Bourbon	1,844	2,054	210		1,843
Boyd	2,324	2,235		89	2,313
Boyle	1,636	1,658	22		1,635
Bracken	2,741	2,826	85		2,712
Breathitt	1,045	1,117	72		1,097
Breckinridge	2,814	2,997	183		2,821
Bullitt	1,434	1,498	64		1,426
Butler	1,874	1,974	100		1,891
Caldwell	1,802	1,952	150		1,796
Calloway	2,236	2,248	12		2,269
Campbell	7,063	7,220	157		7,042
Carroll	1,648	1,708	60		1,648
Carter	2,136	2,024		112	2,152
Casey	1,740	1,803	63		1,740
Christian	3,629	3,611		18	3,575
Clark	1,898	1,854		44	1,898
Clay	1,658	1,758	100		1,674
Clinton	1,105	1,148	43		1,147
Crittenden	1,961	2,055	94		1,982
Cumberland	1,305	1,290		15	1,339
Daviess	4,804	4,880	76		4,784
Edmonson	1,116	1,197	81		1,122
Estill	1,604	1,650	46		1,614
Elliott	1,003	1,018	15		1,071
Fayette	4,328	4,696	368		4,328
Fleming	2,813	2,821	8		2,829
Floyd	1,532	1,554	22		1,593
Franklin	2,636	2,593		43	2,638
Fulton	1,426	1,335		91	1,099
Gallatin	958	1,037	79		958
Garrard	1,676	2,002	326		1,667
Grant	2,663	2,490		173	2,660
Graves	4,101	4,189	88		4,074
Grayson	2,676	2,770	94		2,677
Green	1,776	1,827	51		1,781
Greenup	2,356	2,445	89		2,324
Hancock	1,356	1,431	75		1,356
Hardin	3,300	3,270		30	3,302
Harlan	869	914	45		867
Harrison	2,850	2,893	43		2,846
Hart	2,719	2,908	189		2,705
Henderson	3,588	3,529		59	3,546
Henry	2,317	2,487	170		2,317
Hickman	1,753	1,795	42		1,730
Hopkins	3,263	3,278	15		3,270
Jackson	939	970	31		939
Jefferson	42,338	44,705	2,367		43,523
Jessamine	1,384	1,606	222		1,375
Johnson	1,371	1,428	57		1,461
Kenton	10,131	10,594	463		9,790
Knox	1,549	1,583	34		1,666
Larue	1,635	1,755	120		1,648

No. 4—Continued.

Legal voters, white, 1877.	Increase.	Decrease.	Enrolled militia, 1876.	Enrolled militia, 1877.	Increase.	Decrease.
2,249	73	-----	1,699	-----	-----	-----
2,224	81	-----	1,588	-----	-----	-----
1,693	55	-----	1,166	-----	-----	-----
3,600	1,206	-----	1,712	-----	-----	-----
3,540	86	-----	2,676	-----	-----	-----
2,133	138	-----	1,411	-----	-----	-----
944	48	-----	670	-----	-----	-----
2,660	98	-----	2,107	-----	-----	-----
2,054	211	-----	1,117	-----	-----	-----
2,261	-----	52	1,726	-----	-----	-----
1,658	23	-----	1,013	-----	-----	-----
2,811	99	-----	2,016	-----	-----	-----
1,177	80	-----	892	-----	-----	-----
3,001	180	-----	1,919	-----	-----	-----
1,486	60	-----	882	-----	-----	-----
1,985	94	-----	1,468	-----	-----	-----
1,221	-----	575	1,369	-----	-----	-----
2,304	35	-----	1,801	-----	-----	-----
7,220	178	-----	4,944	-----	-----	-----
1,708	60	-----	1,191	-----	-----	-----
2,084	-----	68	1,796	-----	-----	-----
1,803	63	-----	1,272	-----	-----	-----
3,611	36	-----	2,814	-----	-----	-----
1,854	-----	44	1,456	-----	-----	-----
1,837	163	-----	1,409	-----	-----	-----
1,207	60	-----	834	-----	-----	-----
2,058	76	-----	1,592	-----	-----	-----
1,330	-----	9	988	-----	-----	-----
4,880	96	-----	3,750	-----	-----	-----
1,217	95	-----	868	-----	-----	-----
1,653	39	-----	1,133	-----	-----	-----
1,086	15	-----	911	-----	-----	-----
4,696	368	-----	2,648	-----	-----	-----
2,874	45	-----	2,068	-----	-----	-----
1,645	52	-----	1,317	-----	-----	-----
2,582	-----	56	1,802	-----	-----	-----
1,112	13	-----	1,066	-----	-----	-----
1,037	79	-----	659	-----	-----	-----
1,957	290	-----	1,181	-----	-----	-----
2,489	-----	171	1,646	-----	-----	-----
4,190	116	-----	3,300	-----	-----	-----
2,783	106	-----	2,042	-----	-----	-----
1,834	53	-----	1,298	-----	-----	-----
2,462	138	-----	1,602	-----	-----	-----
1,431	75	-----	978	-----	-----	-----
3,283	-----	19	2,063	-----	-----	-----
918	41	-----	740	-----	-----	-----
2,890	54	-----	1,931	-----	-----	-----
2,902	197	-----	2,205	-----	-----	-----
3,509	-----	37	2,799	-----	-----	-----
2,482	165	-----	1,605	-----	-----	-----
1,758	28	-----	1,342	-----	-----	-----
3,351	81	-----	2,602	-----	-----	-----
1,027	88	-----	826	-----	-----	-----
42,832	-----	691	33,125	-----	-----	-----
1,603	228	-----	777	-----	-----	-----
1,502	41	-----	1,237	-----	-----	-----
10,332	542	-----	7,823	-----	-----	-----
1,659	-----	7	1,322	-----	-----	-----
1,765	117	-----	1,151	-----	-----	-----

No. 4—Continued.

COUNTIES.	White males over 21 years of age, 1876.	White males over 21 years of age, 1877.	Increase.	Decrease.	Legal voters, white, 1876.
Laurel	1,215	1,350	135		1,330
Lawrence	1,952	2,068	116		2,019
Lee	722	724	2		722
Letcher	890	963	73		940
Lewis	2,495	2,644	149		2,444
Lincoln	2,340	2,387	47		2,344
Livingston	1,623	1,619		4	1,669
Logan	3,444	3,593	149		3,449
Lyon	1,162	1,160		2	1,153
Madison	3,308	3,423	115		3,337
Magoffin	904	937	33		904
Marion	2,216	2,306	90		2,215
Marshall	1,718	1,760	42		1,804
Martin	434	473	39		444
Mason	3,412	3,500	88		3,397
McCracken	2,675	2,707	32		2,561
McLean	1,552	1,601	49		1,553
Meade	1,798	1,761		37	1,798
Menifee	547	584	37		544
Mercer	2,409	2,121		288	2,413
Metcalfe	1,673	1,750	77		1,691
Monroe	1,859	1,927	68		1,871
Montgomery	1,454	1,539	85		1,444
Morgan	1,364	1,452	88		1,449
Muhlenburg	2,512	2,620	108		2,509
Nelson	2,455	2,504	49		2,373
Nicholas	1,968	2,006	38		1,968
Ohio	3,376	3,504	128		3,513
Oldham	1,233	1,274	41		1,233
Owen	2,949	3,137	188		2,949
Owsley	728	812	84		796
Pendleton	3,203	3,375	172		3,199
Perry	938	1,043	105		981
Pike	1,888	1,905	17		1,933
Powell	534	575	41		537
Pulaski	3,274	3,412	138		3,388
Robertson	1,201	1,179		22	1,201
Rockcastle	1,489	1,541	52		1,563
Rowan	679	691	12		669
Russell	1,333	1,358	25		1,356
Scott	2,102	2,137	35		2,107
Shelby	2,547	2,576	29		2,547
Simpson	1,823	1,832	9		1,762
Spencer	1,129	1,164	35		1,129
Taylor	1,512	1,553	41		1,512
Todd	1,985	2,034	49		1,954
Trigg	2,078	2,134	56		2,211
Trimble	1,431	1,485	54		1,424
Union	3,104	3,092		12	3,027
Warren	3,901	4,009	108		3,902
Washington	2,331	2,404	73		2,332
Wayne	1,921	1,976	55		1,979
Webster	2,286	2,355	69		2,308
Whitley	1,807	1,833	26		1,915
Wolfe	766	810	44		780
Woodford	1,488	1,467		21	1,470
Total	285,148	294,844	10,766	1,070	286,840

No. 4—Continued.

Legal voters, white, 1877.	Increase.	Decrease.	Enrolled militia, 1876.	Enrolled militia, 1877.	Increase.	Decrease.
1,410	80		1,048			
2,149	130		1,603			
744	22		555			
987	47		742			
2,627	183		1,738			
2,387	43		1,808			
1,668		1	1,347			
3,595	146		2,517			
1,160	7		885			
3,468	131		2,477			
937	33		737			
2,306	91		1,658			
1,850	46		1,479			
484	40		339			
3,509	112		2,371			
2,599	38		2,013			
1,601	48		1,144			
1,763		35	1,385			
584	40		446			
2,121		292	1,896			
1,763	72		1,208			
1,944	73		1,405			
1,539	95		1,066			
1,547	98		1,214			
2,611	102		1,796			
2,500	127		1,342			
2,006	38		1,352			
3,569	56		2,676			
1,274	41		699			
3,137	188		2,060			
832	36		664			
3,371	172		2,442			
1,076	95		761			
1,988	55		1,597			
574	37		390			
3,516	128		2,660			
1,179		22	901			
1,631	68		1,091			
694	25		539			
1,378	22		970			
2,160	53		1,185			
2,576	29		1,787			
1,828	66		1,394			
1,166	37		678			
1,553	41		1,133			
2,019	65		1,513			
2,154		57	1,633			
1,478	54		1,022			
3,065	38		2,561			
4,040	138		2,772			
2,404	72		1,555			
1,920		59	4,712			
2,362	54		1,611			
1,957	42		1,436			
828	48		642			
1,466		4	928			
294,508	9,867	2,199	216,928			

No. 4—Continued.

COUNTIES.	Children be- tween 6 & 20 years old, '76.	Children be- tween 6 & 20 years old, '77.	Increase.	Decrease.	Hogs over six months old, 1876.
Adair	3,521	3,511	-----	10	5,683
Allen	3,369	3,488	119	-----	6,613
Anderson	2,502	2,540	38	-----	4,095
Ballard	3,648	3,855	207	-----	7,873
Barren	4,921	4,787	-----	134	7,664
Bath	2,931	3,015	84	-----	8,147
Bell	1,819	1,746	-----	73	3,153
Boone	2,859	2,951	92	-----	7,116
Bourbon	2,203	1,981	-----	222	8,443
Boyd	3,600	3,601	1	-----	1,886
Boyle	1,923	1,751	-----	172	4,692
Bracken	3,873	4,040	167	-----	4,881
Breathitt	2,230	2,364	134	-----	2,848
Breckinridge	4,122	4,393	271	-----	10,326
Bullitt	1,742	1,879	137	-----	4,572
Butler	3,096	3,283	187	-----	6,873
Caldwell	2,694	2,859	165	-----	4,221
Calloway	3,723	3,805	82	-----	4,719
Campbell	10,067	10,167	100	-----	2,914
Carroll	2,034	2,027	-----	7	2,142
Carter	3,448	3,507	59	-----	3,333
Casey	3,149	3,142	-----	7	5,178
Christian	4,403	4,069	-----	334	5,876
Clark	2,025	2,296	271	-----	7,104
Clay	3,139	3,319	180	-----	5,201
Clinton	2,124	2,126	2	-----	3,684
Crittenden	3,207	3,334	127	-----	6,935
Cumberland	2,028	1,948	-----	80	3,815
Daviess	6,342	6,505	163	-----	9,038
Edmonson	1,882	1,928	46	-----	2,256
Estill	2,750	2,717	-----	33	3,375
Elliot	2,031	2,105	74	-----	2,417
Fayette	2,591	3,097	506	-----	5,076
Fleming	4,295	4,429	134	-----	6,967
Floyd	3,072	3,316	244	-----	7,619
Franklin	3,517	3,625	108	-----	3,782
Fulton	1,883	1,857	-----	26	2,161
Gallatin	1,350	1,278	-----	72	2,985
Garrard	2,159	2,383	224	-----	6,985
Grant	2,996	4,315	1,319	-----	5,229
Graves	6,295	6,586	291	-----	8,358
Grayson	4,171	4,404	233	-----	7,737
Green	2,773	2,788	15	-----	5,269
Greenup	3,628	3,630	2	-----	2,983
Hancock	2,073	2,012	-----	61	2,684
Hardin	4,556	4,549	-----	7	11,546
Harlan	1,835	875	-----	960	5,169
Harrison	4,147	4,130	-----	17	6,917
Hart	4,205	4,501	296	-----	7,367
Henderson	4,262	4,422	160	-----	6,288
Henry	3,054	2,139	-----	915	5,231
Hickman	2,885	2,890	5	-----	3,620
Hopkins	5,112	5,178	66	-----	8,854
Jackson	1,778	1,878	100	-----	1,816
Jefferson	37,574	44,328	6,754	-----	2,673
Jessamine	1,669	1,809	140	-----	2,680
Johnson	2,694	1,746	-----	848	3,307
Kenton	12,551	12,686	135	-----	3,599
Knox	3,020	3,092	72	-----	4,793
Larue	2,229	2,349	120	-----	4,932

No. 4—Continued.

Hogs over six months old, 1877.	Increase.	Decrease.	Studs, jacks, and bulls, 1876.	Studs, jacks, and bulls, 1877.	Increase.	Decrease.
7,154	1,471	-----	58	33	-----	25
7,273	660	-----	27	31	4	-----
4,479	384	-----	22	6	-----	16
9,613	1,740	-----	20	22	2	-----
8,383	719	-----	48	41	-----	7
7,818	-----	329	19	13	-----	6
2,868	-----	285	2	3	1	-----
9,798	2,682	-----	3	4	1	-----
7,712	-----	731	56	68	12	-----
3,279	1,393	-----	5	5	-----	-----
4,626	-----	66	21	16	-----	5
5,968	1,087	-----	30	28	-----	2
6,042	3,194	-----	6	3	-----	3
12,134	1,808	-----	27	21	-----	6
5,224	652	-----	13	16	3	-----
8,681	1,808	-----	8	16	8	-----
5,436	1,215	-----	11	7	-----	4
8,769	4,050	-----	13	19	6	-----
1,647	-----	1,267	15	11	-----	4
2,532	390	-----	14	5	-----	9
5,517	2,184	-----	20	9	-----	11
8,184	3,006	-----	24	28	4	-----
8,321	2,445	-----	29	16	-----	13
7,763	659	-----	42	36	-----	6
8,964	3,763	-----	15	19	4	-----
4,747	1,063	-----	14	16	2	-----
9,269	2,334	-----	15	15	-----	-----
4,961	1,146	-----	4	6	2	-----
9,528	490	-----	31	31	-----	-----
4,068	1,812	-----	11	11	-----	-----
5,025	1,650	-----	20	18	-----	2
4,762	2,345	-----	8	5	-----	3
6,087	1,011	-----	19	16	-----	3
7,218	251	-----	2	1	-----	1
9,569	1,950	-----	-----	5	5	-----
4,635	853	-----	26	17	-----	9
2,694	533	-----	11	3	-----	8
2,442	-----	543	2	2	-----	-----
9,485	2,500	-----	41	32	-----	9
6,480	1,251	-----	27	19	-----	8
13,650	5,292	-----	32	32	-----	-----
9,292	1,555	-----	19	22	3	-----
5,711	442	-----	67	16	-----	51
4,884	1,901	-----	4	4	-----	-----
2,780	96	-----	11	6	-----	5
10,211	-----	1,335	31	20	-----	11
5,624	455	-----	7	1	-----	6
9,012	2,095	-----	77	93	16	-----
7,436	69	-----	26	16	-----	4
6,401	113	-----	22	13	-----	9
5,301	70	-----	9	8	-----	1
5,459	1,839	-----	11	14	3	-----
9,141	287	-----	37	18	-----	19
3,602	1,786	-----	2	6	4	-----
4,100	1,427	-----	15	-----	-----	15
2,030	-----	650	28	38	10	-----
7,036	3,729	-----	6	6	-----	-----
4,783	1,184	-----	10	6	-----	4
4,749	-----	44	15	5	-----	10
5,736	804	-----	22	17	-----	5

No. 4—Continued.

COUNTIES.	Children between 6 & 20 years old, '76.	Children between 6 & 20 years old, '77.	Increase.	Decrease.	Hogs over six months old, 1876.
Laurel	2,394	2,508	114		3,239
Lawrence	3,762	4,008	246		4,606
Lee	1,305	1,315	10		1,547
Letcher	1,834	1,936	102		3,507
Lewis	3,757	3,992	235		2,750
Lincoln	3,107	2,938		169	3,352
Livingston	2,568	2,475		93	4,893
Logan	5,102	5,055		47	8,037
Lyon	1,858	1,868	10		2,151
Madison	4,590	3,557		1,033	9,402
Magoffin	1,817	1,885	68		2,930
Marion	3,006	2,957		49	4,805
Marshall	3,210	3,284	74		5,996
Martin	797	483		314	833
Mason	3,974	4,178	204		9,348
McCracken	3,758	3,283		475	3,683
McLean	2,275	2,319	44		6,440
Meade	2,573	2,604	31		2,265
Menifee	880	935	55		548
Mercer	2,729	2,286		443	4,343
Metcalfe	2,421	2,493	72		4,413
Monroe	3,266	3,313	47		6,297
Montgomery	1,671	1,804	133		4,666
Morgan	2,526	2,694	168		2,864
Muhlenburg	3,854	3,927	73		4,921
Nelson	3,331	3,392	61		6,276
Nicholas	2,686	2,712	26		11,486
Ohio	5,276	5,402	126		9,969
Oldham	1,405	1,398		7	2,767
Owen	4,458	4,445		13	6,719
Owsley	1,421	1,492	71		2,034
Pendleton	4,730	4,995	265		8,020
Perry	1,808	2,056	248		3,209
Pike	3,719	3,743	24		6,075
Powell	1,005	1,080	75		1,494
Pulaski	5,891	6,050	159		7,867
Robertson	1,817	1,864	47		2,016
Rockcastle	2,556	2,775	219		2,766
Rowan	1,116	1,155	39		1,324
Russell	2,113	2,239	126		4,485
Scott	2,667	2,680	13		5,599
Shelby	2,442	2,429		13	10,878
Simpson	2,513	2,526	13		5,491
Spencer	1,455	1,577	22		3,118
Taylor	2,467	2,429		38	3,552
Todd	2,401	2,408	7		5,816
Trigg	3,369	3,993		276	4,362
Trimble	1,751	1,821	70		2,950
Union	4,101	4,154	53		8,588
Warren	5,807	6,245	438		11,669
Washington	3,519	3,557	38		2,444
Wayne	3,439	3,421		18	7,065
Webster	3,469	3,441		28	7,281
Whitley	3,462	3,686	224		5,420
Wolfe	1,576	1,630	54		1,634
Woodford	1,654	1,650		4	2,571
Total	394,237	404,973	17,734	6,998	586,481

No. 4—Continued.

Hogs over six months old, 1877.	Increase.	Decrease.	Studs, jacks, and bulls, 1876.	Studs, jacks, and bulls, 1877.	Increase.	Decrease.
4,202	963	-----	12	13	1	-----
9,063	4,457	-----	11	8	-----	3
1,749	202	-----	1	-----	-----	1
6,523	3,016	-----	1	4	3	-----
3,914	1,164	-----	14	12	-----	2
3,304	-----	48	31	-----	-----	31
6,944	2,051	-----	15	20	5	-----
9,848	1,811	-----	35	26	-----	9
2,952	801	-----	11	15	4	-----
12,770	3,368	-----	67	46	-----	21
6,711	3,781	-----	6	4	-----	2
5,512	707	-----	29	26	-----	3
8,180	2,184	-----	11	6	-----	5
1,989	1,156	-----	3	8	5	-----
11,725	2,377	-----	44	33	-----	11
4,097	414	-----	8	12	4	-----
5,048	-----	1,392	9	6	-----	3
2,690	425	-----	8	21	13	-----
857	309	-----	4	4	-----	-----
3,668	-----	675	9	12	3	-----
5,491	1,078	-----	11	19	8	-----
7,955	1,658	-----	16	35	19	-----
2,961	-----	1,705	69	61	-----	8
6,378	3,514	-----	28	17	-----	11
6,043	1,122	-----	23	27	4	-----
8,687	2,411	-----	18	38	20	-----
12,192	706	-----	24	25	1	-----
11,940	1,971	-----	27	22	-----	5
3,389	622	-----	17	15	-----	2
7,742	1,023	-----	33	24	-----	9
3,297	1,263	-----	1	7	6	-----
9,611	1,591	-----	28	25	-----	3
6,810	3,601	-----	4	4	-----	-----
10,632	4,557	-----	1	3	2	-----
1,822	328	-----	6	3	-----	3
10,452	2,585	-----	40	24	-----	16
2,835	819	-----	9	23	14	-----
4,253	1,487	-----	4	5	1	-----
1,955	631	-----	1	6	5	-----
6,229	1,744	-----	5	9	4	-----
6,621	1,022	-----	16	14	-----	2
11,963	1,085	-----	12	13	1	-----
6,915	1,424	-----	28	29	1	-----
3,453	335	-----	6	2	-----	4
4,389	837	-----	25	25	-----	-----
7,213	1,397	-----	13	13	-----	-----
4,983	621	-----	11	19	8	-----
3,362	412	-----	20	18	-----	2
9,576	988	-----	31	23	-----	8
11,962	293	-----	38	38	-----	-----
2,703	259	-----	4	14	10	-----
9,438	2,373	-----	11	22	11	-----
6,830	-----	451	28	11	-----	17
5,646	226	-----	14	5	-----	9
1,768	134	-----	8	13	5	-----
2,350	-----	221	25	38	13	-----
727,685	150,946	9,742	2,208	1,979	261	490

No. 4—Continued.

COUNTIES.	Rates per season, 1876.	Rates per season, 1877.	Increase.	Decrease.	Tavern licenses, 1876.
Adair	\$164	\$111		\$53	2
Allen	100	132	\$32		
Anderson	99	26		73	2
Ballard	162	161		1	
Barren	246	207		39	3
Bath	121	90		31	3
Bell	10	16	6		1
Boone	17	20	3		1
Bourbon	1,199	1,206	7		13
Boyd	11	14	3		
Boyle	153	204	51		
Bracken	211	180		31	5
Breathitt	26	7		19	
Breckinridge	191	132		59	3
Bullitt	82	96	14		
Butler	43	90	47		
Caldwell	80	57		23	
Calloway					
Campbell	68	56		12	14
Carroll	72			72	12
Carter	76	42		34	
Casey	125	92		33	1
Christian	239	128		111	
Clark	363	638	275		2
Clay	64	56		8	
Clinton	68	76	8		
Crittenden	132	90		42	2
Cumberland	23	27	4		
Daviess	278	219		59	3
Edmonson	56	48		8	2
Estill	106	83		23	4
Elliott	32	22		10	2
Fayette	995	488		507	
Fleming		5	5		2
Floyd		25	25		1
Franklin	165	103		62	
Fulton	101	19		82	1
Gallatin	18	10		8	2
Garrard	257	216		41	1
Grant	141	91		50	
Graves	104	163	59		2
Grayson	70	109	39		8
Green	108	90		18	1
Greenup	43	38		5	
Hancock	88	23		65	
Hardin	214	112		102	6
Harlan	24	3		21	2
Harrison	566	626	60		3
Hart	133	96		37	
Henderson	184	140		44	
Henry	89	56		33	2
Hickman	76	88	12		
Hopkins	135	87		48	1
Jackson	11	23	12		
Jefferson					15
Jessamine	274	215		59	1
Johnson	29	25		4	1
Kenton	110	41		69	2
Knox	42	24		18	
Larue	152	101		51	2

No. 4—Continued.

Tavern licenses, 1877.	Increase.	Decrease.	White per- sons that are blind, 1876.	White per- sons that are blind, 1877.	Increase.	Decrease.
		2	2	3	1	
			2	2		
		2	5	1		4
3	3		1	1		
		3	4	3		1
1		2	1	1		
1			1	1		
3	2		3	1		2
4		9	5	2		3
			4	5	1	
			2	1		1
3		2	3	5	2	
			1	2	1	
7	4		8	10	2	
1	1		2	2		
1	1		6	6		
			1	2	1	
1	1		6	8	2	
10		4	1	2	1	
6		6	8	4		4
			5	4		1
1						
			7	4		3
2			11	6		5
			5	3		2
			4	6	2	
3	1		1	6	5	
3			2	5	3	
		2				
3		1	5	5		
3	1		4			4
			4	2		2
3	1		4	6	2	
		1	6	9	3	
			3	6	3	
1			4	1		3
6	4		4	2		2
1			2	2		
			3	2		1
2			2	7	5	
7		1	6	9	3	
		1		7	7	
			1	2	1	
		6	1	2	1	
		1	5	3		2
1			6	2		4
6	3		4	12	8	
			3	4	1	
2	2			3	3	
1		1	1	2	1	
5	5		1			1
2	1		3	3		
2		13	2	4	2	
2	1		3	5	2	
1			1	4	3	
15	13		1			1
1	1		7	4		3
1		1	4			4

No. 4—Continued.

COUNTIES.	Rates per sea- son, 1876.	Rates per sea- son, 1877.	Increase.	Decrease.	Tavern licenses, 1876.
Laurel	\$34	\$49	\$15		3
Lawrence	47	31		\$16	
Lee	1			1	6
Letcher		9	9		
Lewis	53	48		5	
Lincoln	166			166	8
Livingston	99	122	23		
Logan	171	155		16	2
Lyon	45	34		11	
Madison	559	455		104	
Magoffin	24	62	38		
Marion	217	120		97	1
Marshall	57	45		12	2
Martin		3	3		3
Mason	251	272	21		
McCracken	50	95	45		1
McLean	64	34		30	9
Meade	68	72	4		4
Menifee	15	16	1		
Mercer	48	20		28	
Metcalfe	63	116	53		
Monroe	79	158	79		
Montgomery	98	5		93	
Morgan	18	19	1		
Muhlenburg	122	130	8		1
Nelson	141	261	120		4
Nicholas	200	175		25	
Ohio	118	123	5		
Oldham	133	103		30	4
Owen	182	147		35	
Owsley	1	17	16		1
Pendleton	191	143		48	7
Perry	16	15		1	
Pike	5	13	8		1
Powell	25	22		3	
Pulaski	160	80		80	1
Robertson	30	132	102		
Rockcastle	18	24	6		
Rowan	5	22	17		1
Russell	17	38	21		
Scott	427	220		207	3
Shelby	111	99		12	1
Simpson	62	202	40		1
Spencer	50	12		38	
Taylor	136	127		9	
Todd	84	111	27		2
Trigg	141	95		46	3
Trimble	172	103		69	1
Union	216	166		50	4
Warren	219	224	5		
Washington	23	93	70		
Wayne	57	82	25		
Webster	110	43		67	
Whitley	69	22		47	2
Wolfe	35	51	16		1
Woodford	874	536		338	2
Total	\$15,123	\$12,814	\$1,440	\$3,749	207

No. 4—Continued.

Tavern licenses, 1877.	Increase.	Decrease.	White per- sons that are blind, 1876.	White per- sons that are blind, 1877.	Increase.	Decrease.
3			4	4		
7	1			3	3	
1	1			4	4	
5	5		3	6	3	
		8	5	4		1
			4	1		3
1		1	3	4	1	
			4	2		2
				1	1	
			5	5		
		1	3	3		
1		1	6	3		3
2		1				
			1			1
3	2		1	1		
8		1				
		4	1			1
1	1		3			3
			1			
			7	2	1	
				12	5	
				3	3	
			4	3		1
		1	3	5	2	
3		1				
1	1					
1	1		4	8	4	
7	3		4	2		2
2	2		1	2	1	
		1	3	3		
4		3	4	1		3
			4	1		3
1			1	2	1	
			1			1
		1	15	7		8
1	1		6	5		1
			5	5		
		1		3	3	
			2	2		
5	2					
6	5		2	1		1
		1	7	4		3
				1	1	
8	6					
2		1	11	6		5
2	1		1	2	1	
6	2		9	5		4
14	14		1	3	2	
			4	4		
			5	4		1
14	14		1	1		
1		1	1	1		
1			2	1		1
4	2					
230	109	86	343	344	102	101

No. 4—Continued.

COUNTIES.	White persons that are deaf & dumb, 1876.	White persons that are deaf & dumb, 1877.	Increase.	Decrease.	Number of dogs over 2, 1876.
Adair	12	15	3		3
Allen	7	8	1		
Anderson	4	1		3	
Ballard	6	6			2
Barren	2	7	5		8
Bath	1	2	1		
Bell					3
Boone	2	10	8		8
Bourbon					23
Boyd	5	7	2		4
Boyle	2	1		1	
Bracken		13	13		
Breathitt	4	2		2	4
Breckinridge					13
Bullitt					18
Butler	3	4	1		6
Caldwell		4	4		12
Calloway	3	6	3		5
Campbell	4			4	5
Carroll	8	3		5	1
Carter	4			4	5
Casey					16
Christian	2	2			17
Clark	5	6	1		
Clay	7	3		4	10
Clinton	2	2			1
Crittenden	2	4	2		20
Cumberland					
Daviess	4	3		1	33
Edmonson		4	4		5
Estill	3	3			
Elliott	10	6		4	
Fayette	1	1			75
Fleming	4	5	1		7
Floyd	2	4	2		7
Franklin	8	6		2	26
Fulton	2			2	5
Gallatin					1
Garrard	3	4	1		43
Grant		6	6		15
Graves	9	5		4	5
Grayson	5	7	2		15
Green	8			8	2
Greenup					17
Hancock		1	1		3
Hardin	5	3		2	33
Harlan	7	6		1	2
Harrison	13	11		2	18
Hart	6	7	1		
Henderson	2	3	1		6
Henry	1	3	2		14
Hickman	1	1			2
Hopkins	4	3		1	15
Jackson					
Jefferson	15	5		10	82
Jessamine	1	2	1		4
Johnson	1	1			1
Kenton	13	13			11
Knox	16	16			
Larue	4	6	2		

No. 4—Continued.

Number of dogs over 2, 1877.	Increase.	Decrease.	Number of sheep killed by dogs, 1876.	Number of sheep killed by dogs, 1877.	Increase.	Decrease.
		3	134	114		20
			179	141		38
			79	46		33
18	16		340	180		160
10	2		178	66		112
			84	4		80
3			84	24		60
47	39		126	85		41
		23	327	426	99	
5	1		94	122	28	
			157	53		104
13	13		77	61		16
1		3	94	75		19
2		11	248	139		109
6		12	126	77		49
1		5	187	114		73
9		3	260	77		183
		5	250	166		84
1		4	82	29		53
		1	3			3
5			322	52		270
7		9	190	101		89
10		7	452	129		323
86	86		49	190	141	
10			53	42		11
		1	77	31		46
42	22		225	368	143	
			11	31	20	
3		30	256	157		99
		5	179	93		86
			1	14	13	
			63	141	78	
75			181	59		122
1		6	182	119		63
6		1	97	73		24
15		11	190	216	26	
2		3	95	10		85
		1	85			85
		43	133	362	229	
23	8		69	91	22	
7	2		451	296		155
7		8	161	108		53
1		1	65	72	7	
1		16	288	65		223
7	4		84	39		45
		33	94	96	2	
		2	80	1		79
9		9	116	124	8	
			94	81		13
75	69		336	158		178
86	72		49	205	156	
5	3		104	55		49
13		2	453	97		356
			11	13	2	
125	43		6			6
12	8		186	150		36
		1	72	33		39
70	59		55	120	65	
3	3		119	120	1	
			14	27	13	

No. 4—Continued.

COUNTIES.	White persons that are deaf & dumb, 1876.	White persons that are deaf & dumb, 1877.	Increase.	Decrease.	Number of dogs over 2, 1876.
Laurel		4	4		8
Lawrence	1			1	5
Lee	6	2		4	5
Letcher	2	2			
Lewis	1	4	3		27
Lincoln	2	4	2		3
Livingston	1	2	1		16
Logan	3	2		1	22
Lyon					14
Madison	4	6	2		30
Magoffin	1	1			1
Marion	3	1		2	
Marshall	1	2	1		4
Martin					
Mason	1	1			3
McCracken		5	5		2
McLean	1			1	2
Meade		1	1		
Menifee					1
Mercer	2			2	16
Metcalfe	1			1	12
Monroe	8	4		4	
Montgomery		2	2		
Morgan	3	7	4		4
Muhlenburg	6	5		1	5
Nelson		1	1		42
Nicholas					5
Ohio	3	2		1	10
Oldham		1	1		11
Owen	4	3		1	14
Owsley		2	2		2
Pendleton	4	1		3	10
Perry	4	5	1		1
Pike	3	3			8
Powell	2	2			
Pulaski	5	11	6		4
Robertson	1	1			6
Rockcastle	7	4		3	2
Rowan					
Russell	3	4	1		6
Scott					18
Shelby					47
Simpson	6			6	5
Spencer		2	2		
Taylor					4
Todd	2	1		1	2
Trigg	3	1		2	32
Trimble	1			1	18
Union		2	2		51
Warren	6	4		2	22
Washington	3	3			
Wayne	1	1			6
Webster	4			4	
Whitley	1	1			2
Wolfe					
Woodford		2	2		15
Total	343	353	111	104	1,154

No. 4—Continued.

Number of dogs over 2, 1877.	Increase.	Decrease.	Number of sheep killed by dogs, 1876.	Number of sheep killed by dogs, 1877.	Increase.	Decrease.
10	2		81	134	53	
		5	193	102		91
1		4	90	19		71
1	1		67	24		43
18		9	89	191	102	
		3	96	46		50
21	5		780	272		508
19		3	262	219		43
4		10	286	129		157
		30	142	50		92
7	6		119	28		91
61	61		2	23	21	
		4	230	138		92
			16	14		2
52	49		55	89	34	
5	3		203	185		18
97	95		142	201	59	
			149	24		125
		1	38	15		23
14		2	144	50		94
2		10	82	57		25
1	1		111	71		40
34	34		175	11		164
8	4		142	92		50
		5	547	365		182
50	8		75	105	30	
6	1		180	84		96
5		5	327	278		49
		11	135	184	49	
9		5	298	332	34	
		2	48	7		41
30	20		32	30		2
2	1		57	9		48
6		2	54	5		49
			109	41		68
3		1	354	74		280
9	3		34	31		3
1		1	64	70	6	
			7			7
		6	171	113		58
18			212	123		89
69	22		354	109		245
9	4		120	128	8	
			126	36		88
2		2	101	88		13
		2	167	12		155
13		19	566	92		474
1		17	211	233	22	
65	4		388	299		89
20		2	456	284		172
35	35		2			2
4		2	106	23		83
			189	6		183
1		1	91	36		55
1	1		100	58		42
35	20		200	19		181
1,571	840	423	18,432	11,598	1,471	8,305

No. 4—Continued.

COUNTIES.	Value of sheep killed by dogs, '76.	Value of sheep killed by dogs, '77.	Increase.	Decrease.	Pounds of to- bacco, 1876.	Pounds of to- bacco, 1877.
Adair	\$295	\$237		\$58	1,695,355	1,066,785
Allen	362	303		59	1,309,887	814,521
Anderson	369	191		178	17,480	14,400
Ballard	790	409		381	3,540,794	2,934,370
Barren	378	163		215	2,717,270	1,699,784
Bath	167	11		156	22,725	31,460
Bell	149	38		111	8,300	12,294
Boone	595	370		225	619,020	898,603
Bourbon	2,184	2,972	\$788		9,340	4,130
Boyd	189	242	53		9,627	27,963
Boyle	838	422		416	5,807	
Bracken	334	330		4	4,412,350	4,437,000
Breathitt	118	150	32		9,354	21,339
Breckinridge	600			600	3,456,520	4,546,000
Bullitt	434	312		122	23,875	41,025
Butler	383	248		135	1,757,094	995,533
Caldwell	642	132		510	3,491,060	768,983
Calloway	411	272		139	3,150,200	1,563,200
Campbell	326	108		218	341,489	214,295
Carroll	10			10	1,268,280	1,952,700
Carter	690	95		595	31,480	41,284
Casey	516	304		212	154,562	151,424
Christian	1,563	409		1,154	8,845,750	2,860,750
Clark	367	1,272	905		3,400	25,600
Clay	107	80		27	16,699	29,329
Clinton	165	62		103	675,575	238,650
Crittenden	422	782	360		2,808,792	1,701,113
Cumberland	17	60	43		2,108,275	1,192,288
Daviess	887	502		385	5,330,052	8,778,945
Edmonson	428	200		228	839,892	498,190
Estill	3	53	50		2,081	28,996
Elliott	131	258	127		65,356	29,361
Fayette	1,601	849		752		
Fleming	704	534		170	799,725	737,970
Floyd	189	152		37	14,766	25,806
Franklin	810	1,152	342		639,155	585,563
Fulton	308	39		269	549,446	323,700
Gallatin	263			263	597,370	518,000
Garrard	563	1,564	1,001		73,525	37,150
Grant	182	361	179		980,058	1,034,300
Graves	1,018	411		607	6,435,617	3,671,047
Grayson	376	214		162	2,062,550	1,908,885
Green	187	175		12	1,862,900	1,358,200
Greenup	423	146		277	3,540	7,140
Hancock	190	86		104	1,603,670	2,036,100
Hardin	285	326	41		824,185	419,470
Harlan	139	2		137	6,864	9,971
Harrison	730	900	170		1,146,900	1,052,310
Hart	190	186		4	2,629,148	1,634,371
Henderson	848	655		193	4,797,003	9,121,511
Henry	160	865	705		1,909,945	1,928,222
Hickman	202	117		85	1,140,527	775,760
Hopkins	894	167		727	4,517,300	3,215,500
Jackson	25	36	11		8,813	38,780
Jefferson	21			21		
Jessamine	912	482		430	4,655	7,450
Johnson	155	61		94	17,608	32,965
Kenton	275	596	321		1,486,300	1,633,800
Knox	210	189		21	13,262	23,882
Larue	39	79	40		759,835	647,700

No. 4—Continued.

Increase.	Decrease.	Pounds of hemp, 1876.	Pounds of hemp, 1877.	Increase.	Decrease.
	628,570				
	495,366				
	3 080		300	300	
	606,424				
	1,017,486				
8,735					
3,994					
279,583					
18,336	5,210	933,040	659,600		273,440
	5,807	310,600	181,200		129,400
24,650					
11,985		50			50
1,089,480		700			700
17,150		100			100
	761,561				
	2,722,077				
	1,587,000				
	127,194	500			500
684,420			2,643	2,643	
9,804		310			310
	3,138		170	170	
	5,985,000				
		766,600	335,900		430,700
22,200		100			100
12,630					
	436,925				
	1,107,679		20	20	
	915,987				
3,448,893					
	341,702	50			50
26,915		301			301
	35,995		70	70	
		3,439,937	3,130,900		309,037
	61,755	38,620	30,880		7,740
11,040					
	53,592	123,700	185,100	61,400	
	225,746				
	79,370				
	36,375	99,200	109,500	10,300	
54,242					
	2,764,570	175			175
	153,665				
	504,700				
3,600			1,200	1,200	
432,430					
	404,715				
3,107		41			41
	94,590	16,500	11,000		5,500
	994,777				
4,324,508		3,000			3,000
18,277					
	364,767				
	1,301,800				
29,967					
2,795		2,728,375	2,363,200		365,175
15,357					
147,500					
10,620		52			52
	112,135				

No. 4—Continued.

COUNTIES.	Value of sheep killed by dogs, '76.	Value of sheep killed by dogs, '77.	Increase.	Decrease	Pounds of to- bacco, 1876.	Pounds of to- bacco, 1877.
Laurel	\$173	\$293	\$120		24,825	57,610
Lawrence	359	167		\$192	25,981	42,393
Lee	199	30		169	7,531	16,338
Letcher	126	47		79	7,836	16,827
Lewis	194	451	257		281,925	384,700
Lincoln	345	147		198	17,840	2,100
Livingston	1,345	624		721	1,814,187	1,377,081
Logan	658	526		132	5,349,625	1,970,480
Lyon	545	241		304	1,387,295	400,547
Madison	722	201		521	42,900	52,500
Magoffin	213	45		168	8,444	29,639
Marion	7			7	305,120	265,380
Marshall	374	211		163	2,046,525	956,159
Martin	28	24		4	4,107	10,733
Mason	367	619	252		3,522,100	3,816,350
McCracken	554	434		120	1,579,081	1,318,800
McLean	345	389	44		2,627,565	2,777,835
Meade	374	74		300	651,065	635,400
Menifee	79	35		44	17,925	29,656
Mercer	797	315		482		515
Metcalfe	186	124		62	1,398,129	999,167
Monroe	252	168		84	1,040,910	667,150
Montgomery	917	118		799	1,211	
Morgan	273	175		98	30,167	31,972
Muhlenburg	1,026	648		378	3,384,941	1,967,617
Nelson	268	426	158		4,010	12,840
Nicholas	997	378		619	796,560	793,750
Ohio	743	694		49	4,146,963	3,992,881
Oldham	664	984	320		186,650	134,700
Owen	1,581	1,406		175	3,576,976	4,012,970
Owsley	150	13		137	11,848	17,068
Pendleton	176	125		51	3,631,262	3,723,625
Perry	108	13		95	5,425	11,199
Pike	95	10		85	20,770	41,680
Powell	327	123		204	6,405	22,141
Pulaski	717	138		579	19,997	40,933
Robertson	118	115		3	1,625,200	1,372,495
Rockcastle	151	151			10,195	24,685
Rowan	14			14	28,417	20,110
Russell	370	222		148	243,637	165,840
Scott	1,470	661		809	156,300	134,250
Shelby	2,030	524		1,506	294,200	297,050
Simpson	242	280	38		1,825,150	785,116
Spencer	525	139		386	3,000	21,830
Taylor	272	255		17	1,365,836	1,298,680
Todd	649	42		607	4,747,225	2,799,700
Trigg	1,191	279		912	4,688,206	1,584,701
Trimble	771	737		34	941,600	1,229,650
Union	790	683		107	3,316,714	4,586,800
Warren	1,355	992		363	3,428,936	2,072,900
Washington	8			8	12,300	4,300
Wayne	201	40		161	61,007	43,340
Webster	359	12		347	3,941,000	3,439,320
Whitley	199	82		117	870	9,130
Wolfe	202	125		77	13,127	32,978
Woodford	1,646	58		1,588		13,000
Total	\$55,616	\$37,144	\$6,357	\$24,829	148,319,429	120,967,479

No. 4—Continued.

Increase.	Decrease.	Pounds of hemp, 1876.	Pounds of hemp, 1877.	Increase.	Decrease.
32,785					
16,412		35			35
8,807					
8,991					
102,775		1,817			1,817
	15,740	2,000	500		1,500
	437,106				
	3,379,145				
	986,748				
9,600		10,000	5,000		5,000
21,195					
	39,740				
	1,090,366				
6,626		50			50
294,250		399,000	152,500		246,500
	265,281				
150,270					
	15,665				
11,731					
515		109,500	28,000		81,500
	398,962				
	373,760				
	1,211				
1,805		3			3
	1,417,324				
8,830					
	2,810				
	154,082				
	51,950				
435,994					
5,220					
92,363					
5,774		210			210
20,910					
15,736					
20,936					
	252,705				
14,490			110	110	
	8,307				
	77,797				
	22,050	2,296,153	1,967,500		328,653
2,850		596,400	323,200		273,200
	1,040,034				
18,830					
	67,156				
	1,947,525				
	3,103,505				
288,050					
1,270,086					
	1,356,036		100	100	
	8,000				
	17,667				
	501,680				
8,260					
19,851					
13,000		2,958,250	1,960,000		998,250
13,619,160	40,971,110	14,835,369	11,448,593	76,317	3,463,089

No. 4—Continued.

COUNTIES.	Tons of hay, 1876.	Tons of hay, 1877.	Increase.	Decrease.	Bushels of corn, 1876.
Adair	1,094	1,908	814		526,311
Allen	537	1,415	878		571,385
Anderson	292	383	91		434,375
Ballard	775	1,539	764		691,030
Barren	754	1,403	649		674,775
Bath	417	1,030	613		679,055
Bell	203	232	29		149,322
Boone	3,768	6,405	2,637		780,087
Bourbon	2,746	3,794	1,048		991,295
Boyd	981	1,364	383		256,248
Boyle	2,025	2,341	316		432,040
Bracken	550	776	226		585,220
Breathitt	68	75	7		208,426
Breckinridge	1,908	2,373	465		824,705
Bullitt	3,586	4,089	503		437,664
Butler	487	917	430		395,159
Caldwell	352	1,239	887		659,445
Calloway	757	1,091	334		755,035
Campbell	2,737	3,300	563		330,681
Carroll	2,203	2,933	730		278,315
Carter	582	827	245		384,537
Casey	607	911	304		425,473
Christian	1,179	2,719	1,540		1,128,230
Clark	1,880	2,946	1,066		754,595
Clay	210	543	333		352,055
Clinton	264	923	659		238,755
Crittenden	425	1,167	742		647,250
Cumberland	295	624	329		343,190
Daviess	3,368	3,762	394		889,059
Edmonson	83	88	5		271,779
Estill	497	890	393		330,441
Elliott	155	221	66		248,037
Fayette	4,647	5,034	387		872,100
Fleming	1,381	2,020	639		801,343
Floyd	204	343	139		370,328
Franklin	735	1,695	960		532,615
Fulton	475	1,273	798		414,640
Gallatin	1,522	1,283		239	271,670
Garrard	864	1,218	354		719,265
Grant	1,096	1,362	266		656,516
Graves	1,171	2,155	984		1,046,440
Grayson	284	649	365		582,335
Green	262	594	332		369,240
Greenup	1,614	1,708	94		420,930
Hancock	3,216	3,025		191	302,060
Hardin	3,402	3,551	149		1,074,940
Harlan	312	352	40		181,228
Harrison	1,292	2,172	880		990,321
Hart	183	366	183		579,346
Henderson	2,633	4,130	1,497		798,684
Henry	1,862	2,715	853		730,226
Hickman	533	995	462		579,473
Hopkins	423	1,098	675		727,260
Jackson	210	269	59		157,875
Jefferson	6,220	6,869	649		867,485
Jessamine	473	2,254	1,781		402,285
Johnson	225	363	138		351,261
Kenton	2,607	3,500	893		449,640
Knox	330	653	323		353,266
Larue	523	913	390		456,603

No. 4—Continued.

Bushels of corn, 1877.	Increase.	Decrease.	Bushels of wheat, 1876.	Bushels of wheat, 1877.	Increase.	Decrease.
579,586	53,275	-----	34,461	43,847	9,386	-----
636,959	65,574	-----	43,739	51,649	7,910	-----
489,732	55,357	-----	28,395	21,060	-----	7,335
583,019	-----	108,011	125,530	91,854	-----	33,676
618,870	-----	55,905	60,124	62,465	2,341	-----
807,655	128,600	-----	25,350	30,471	5,121	-----
167,093	17,771	-----	1,867	2,201	334	-----
852,443	72,356	-----	3,682	12,556	8,874	-----
668,694	-----	322,701	74,926	82,530	7,604	-----
230,782	-----	25,466	6,245	8,587	2,342	-----
442,305	10,265	-----	68,380	48,272	-----	20,108
502,529	-----	82,691	39,775	46,868	7,093	-----
262,808	54,382	-----	2,036	1,704	-----	332
878,520	53,815	-----	50,810	50,690	-----	120
535,053	97,389	-----	24,055	16,038	-----	8,017
531,879	136,720	-----	21,164	25,851	4,687	-----
477,872	-----	181,573	46,911	32,523	-----	14,388
574,100	-----	180,935	58,253	54,875	-----	3,378
256,345	-----	74,336	27,801	24,203	-----	3,598
364,385	86,070	-----	11,970	10,477	-----	1,493
440,681	56,144	-----	5,663	1,773	-----	3,890
480,440	54,967	-----	19,385	21,276	1,891	-----
1,006,027	-----	122,203	225,575	283,900	58,325	-----
680,150	-----	74,445	46,970	42,573	-----	4,397
403,794	51,739	-----	5,902	8,897	2,995	-----
279,020	40,265	-----	21,126	29,859	8,733	-----
714,981	67,731	-----	30,075	42,709	12,634	-----
390,930	47,740	-----	23,593	28,744	5,151	-----
954,490	65,431	-----	58,727	67,245	8,518	-----
305,956	34,177	-----	18,189	20,411	2,222	-----
378,816	48,375	-----	10,067	10,381	314	-----
263,592	15,555	-----	3,465	2,907	-----	558
965,200	93,100	-----	86,060	81,090	-----	4,970
865,805	64,462	-----	62,448	73,143	10,695	-----
431,024	60,696	-----	4,744	7,021	2,277	-----
645,382	112,767	-----	33,615	32,810	-----	805
391,715	-----	22,925	100,994	51,412	-----	49,582
265,200	-----	6,470	4,715	3,500	-----	1,215
789,525	70,260	-----	49,208	66,390	17,182	-----
865,181	208,665	-----	18,936	17,652	-----	1,284
910,822	-----	135,618	125,889	105,447	-----	20,442
635,070	52,735	-----	28,927	32,105	3,178	-----
372,035	2,795	-----	23,461	27,191	3,730	-----
547,180	126,250	-----	17,312	20,526	3,214	-----
327,020	24,960	-----	13,022	8,269	-----	4,753
1,131,515	56,575	-----	191,363	130,382	-----	60,981
205,579	24,351	-----	1,231	1,426	195	-----
875,140	-----	115,181	67,120	82,526	15,406	-----
732,055	152,709	-----	62,269	73,914	11,645	-----
1,191,746	393,062	-----	49,286	60,918	11,632	-----
693,545	-----	36,681	11,115	15,136	4,021	-----
583,231	3,758	-----	129,275	59,868	-----	69,407
658,497	-----	68,763	50,550	56,380	5,830	-----
200,405	42,530	-----	6,735	5,445	-----	1,290
886,782	19,297	-----	78,270	45,846	-----	32,424
479,704	77,419	-----	64,321	71,085	6,764	-----
408,645	57,384	-----	5,162	6,560	1,398	-----
420,705	-----	28,935	8,225	8,554	329	-----
381,833	28,567	-----	9,035	14,663	5,628	-----
528,218	71,615	-----	67,502	56,668	-----	10,834

No. 4—Continued.

COUNTIES.	Tons of hay, 1876.	Tons of hay, 1877.	Increase.	Decrease.	Bushels of corn, 1876.
Laurel	907	1,104	197		214,608
Lawrence	420	746	326		502,892
Lee	110	148	38		95,296
Letcher	216	268	52		152,449
Lewis	1,308	1,537	229		464,464
Lincoln	2,051	2,116	65		461,485
Livingston	1,207	2,013	806		542,917
Logan	1,055	4,727	3,672		1,114,540
Lyon	421	654	233		371,488
Madison	824	1,630	806		1,221,460
Magoffin	237	485	248		219,822
Marion	1,479	2,540	1,061		610,140
Marshall	409	1,103	694		696,160
Martin	9	21	12		65,755
Mason	1,251	2,185	934		1,009,430
McCracken	616	997	381		314,736
McLean	735	1,223	488		383,730
Meade	694	516		178	474,635
Menifee	74	162	88		87,798
Mercer	1,757	1,978	221		585,791
Metcalfe	555	1,167	612		338,077
Monroe	497	1,620	1,123		457,581
Montgomery	1,114	1,043		71	545,045
Morgan	431	723	292		301,641
Muhlenburg	737	1,444	707		424,583
Nelson	2,718	3,230	512		822,765
Nicholas	514	840	326		592,280
Ohio	1,656	3,131	1,475		696,787
Oldham	1,615	1,713	98		397,695
Owen	1,697	1,000		697	792,692
Owsley	131	267	136		148,699
Pendleton	1,234	1,469	235		748,606
Perry	7	13	6		87,824
Pike	223	203		20	467,466
Powell	78	202	124		110,808
Pulaski	1,149	1,811	662		574,763
Robertson	47	91	44		277,090
Rockcastle	397	649	252		240,760
Rowan	121	212	91		96,630
Russell	142	542	400		296,545
Scott	1,172	1,915	743		1,202,461
Shelby	2,707	2,362		345	1,090,720
Simpson	302	637	335		706,840
Spencer	802	996	194		537,095
Taylor	517	967	450		276,714
Todd	662	1,219	557		699,120
Trigg	770	1,713	943		741,055
Trimble	967	1,299	332		352,990
Union	2,495	3,304	809		970,178
Warren	769	1,854	1,085		1,447,320
Washington	262	111		151	629,750
Wayne	489	1,516	1,027		456,813
Webster	669	1,024	355		597,533
Whitley	313	699	386		341,780
Wolfe	363	581	218		167,749
Woodford	3,191	3,168		23	574,090
Total	121,777	177,675	57,813	1,915	61,533,490

No. 4—Continued.

Bushels of corn, 1877.	Increase.	Decrease.	Bushels of wheat, 1876.	Bushels of wheat, 1877.	Increase.	Decrease.
265,600	50,992		8,636	11,718	3,082	
405,623		97,269	6,766	7,941	1,175	
143,465	48,169		3,127	2,442		685
98,964		53,485	7,876	5,720		2,156
559,160	94,696		33,577	20,548		13,029
294,525		166,960	42,694	29,256		13,438
551,624	8,707		30,368	32,164	1,796	
1,121,984	7,444		227,832	281,347	53,515	
288,290		83,198	25,335	23,937		1,398
1,263,100	41,640		45,830	52,880	7,050	
258,357	38,535		4,387	5,429	1,042	
802,405	192,265		61,735	50,664		11,071
488,185		207,975	58,140	56,222		1,918
91,802	26,047		255	459	204	
1,015,280	5,850		84,995	104,445	19,450	
274,842		39,894	22,876	31,839	8,963	
382,325		1,405	40,431	38,454		1,977
567,390	92,755		55,001	36,219		18,782
100,485	12,687		1,563	1,407		156
651,200	65,409		70,001	70,778	777	
400,446	62,369		25,614	33,652	8,038	
459,056	1,475		38,946	43,879	4,933	
371,975		173,070	24,850	17,566		7,284
376,311	74,670		6,004	7,169	1,165	
521,287	96,704		54,364	56,174	1,810	
1,009,235	186,470		93,830	67,718		26,112
673,950	81,670		35,630	42,553	6,923	
815,350	118,563		61,184	60,991		193
480,900	83,205		4,665	6,655	1,990	
909,547	116,855		12,865	13,628	763	
188,437	39,738		4,785	5,279	494	
833,655	85,049		44,208	44,534	326	
143,918	56,094		187	643	456	
506,140	38,674		9,319	13,207	3,888	
127,772	16,964		2,686	2,479		207
642,580	67,817		35,329	45,008	9,679	
304,085	26,995		14,815	23,777	8,962	
297,805	57,045		7,404	10,483	3,079	
145,018	48,388		1,563	2,121	558	
321,625	25,080		16,335	21,400	5,065	
947,510		254,951	74,390	90,026	15,636	
1,173,805	83,085		51,710	35,777		15,933
611,972		94,868	112,434	117,500	5,066	
624,616	87,521		65,730	54,821		10,909
338,718	62,004		24,668	28,941	4,273	
648,080		51,040	123,399	183,511	60,112	
567,572		173,483	63,106	80,244	17,138	
370,950	17,960		6,673	12,000	5,327	
1,212,120	241,942		109,216	106,040	5,824	
1,365,215		82,105	123,181	117,627		5,554
727,390	97,640		65,531	36,569		28,962
498,144	41,331		30,827	41,610	10,783	
479,470		118,063	68,790	51,291		17,499
385,520	43,740		8,169	15,765	7,596	
208,425	40,676		3,185	2,645		540
588,120	14,030		96,605	149,540	52,935	
64,049,490	5,756,605	3,240,605	4,939,613	5,602,015	599,472	537,080

No. 4—Continued.

COUNTIES.	Bushels of barley, 1876.	Bushels of barley, 1877.	Increase.	Decrease	Tons of pig met'l, 1876.	Tons of pig met'l, 1877.	Increase.
Adair							
Allen							
Anderson							
Ballard							
Barren	515			515			
Bath							
Bell							
Boone		340	340				
Bourbon	118	4,415	4,297				
Boyd	120	200	80		3,977	10,400	6,423
Boyle	3,540	4,150	610				
Bracken	40	195	155				
Breatbitt							
Breckinridge	265	302	37				
Bullitt		60	60				
Butler	30	15		15			
Caldwell					1		
Calloway							
Campbell	17,215	18,891	1,676				
Carroll	155	435	280				
Carter							
Casey							
Christian		3,362	3,362				
Clark	7,765	8,030	265				
Clay							
Clinton							
Crittenden		6	6				
Cumberland	30	10		20			
Daviess	480	275		205			
Edmonson							
Estill		1	1				
Elliott							
Fayette	37,680	75,780	38,100				
Fleming							
Floyd							
Franklin	1,530	6,658	5,128				
Fulton							
Gallatin	300	200		100			
Garrard							
Grant	10	500	490				
Graves	56			56			
Grayson							
Green	1,640			1,640			
Greenup	1,300	6,250	4,950		900	7,025	6,125
Hancock							
Hardin		150	150				
Harlan							
Harrison		300	300				
Hart							
Henderson		76	76				
Henry	350			350			
Hickman							
Hopkins	50			50			
Jackson							
Jefferson	4,088	1,445		2,643			
Jessamine	7,910	24,425	16,515				
Johnson							
Kenton	240	300	60				
Knox							
Larue	207			207			

No. 4—Continued.

COUNTIES.	Bushels of barley, 1876.	Bushels of barley, 1877.	Increase.	Decrease.	Tons of pig met'l, 1876.	Tons of pig met'l, 1877.	Increase.
Laurel							
Lawrence							
Lee	30			30			
Letcher							
Lewis	1,120			1,120			
Lincoln	900			900			
Livingston				75			
Logan	75						
Lyon							
Madison							
Magoffin							
Marion		40	40				
Marshall							
Martin							
Mason	6,453	16,160	9,707				
McCracken							
McLean							
Meade	120			120			
Menifee							
Mercer	230			230			
Metcalfe							
Monroe							
Montgomery							
Morgan							
Muhlenburg		349	349				
Nelson	440			440			
Nicholas							
Ohio	96			96	1		
Oldham							
Owen	10			10			
Owsley							
Pendleton	1,789	1,995	206				
Perry							
Pike							
Powell							
Pulaski							
Robertson							
Rockcastle							
Rowan							
Russell							
Scott	11,580	6,174		5,406			
Shelby	40	80	40				
Simpson	114	13		101			
Spencer							
Taylor							
Todd							
Trigg						1,875	1,875
Trimble	240	30		210			
Union							
Warren	1,000			1,000			
Washington	100			100			
Wayne							
Webster	725	75		650			
Whitley							
Wolfe							
Woodford	37,260	106,780	69,520				
Total	147,956	288,467	156,800	16,289	4,879	19,300	14,423

NEGRO.—No. 4—Continued.

COUNTIES.	Acres of land, 1876.	Acres of land, 1877.	Increase.	Decrease.	Value of land, 1876.
Adair	7,122	6,580		542	\$29,324
Allen	1,779	1,456		323	9,313
Anderson	213	254	41		3,180
Ballard	1,741	949		792	11,781
Barren	5,473	5,747	274		34,229
Bath	421	478	57		2,985
Bell	655	570		85	745
Boone	139	214	75		3,050
Bourbon	366	511	145		18,670
Boyd	3	5	2		500
Boyle	1,806	1,797		9	44,135
Bracken	972	938		34	13,245
Breathitt	2,765	2,640		125	2,350
Breckinridge	3,311	3,829	518		17,820
Bullitt	374	587	213		3,230
Butler	1,937	2,328	391		9,205
Caldwell	1,892	1,440		452	13,666
Calloway	1,552	1,724	172		7,435
Campbell	376	57		319	13,780
Carroll	73	370	297		2,500
Carter	87	155	68		1,400
Casey	1,336	1,382	46		3,002
Christian	5,033	5,187	154		45,150
Clark	834	891	57		11,025
Clay	2,931	2,928		3	8,430
Clinton	310	315	5		800
Crittenden	2,145	2,114		31	11,107
Cumberland	932	703		229	4,025
Daviess	3,614	3,292		322	37,965
Edmonson	1,897	1,977	80		13,110
Estill	686	580		106	2,170
Elliott	502	82		420	838
Fayette	601	999	398		34,150
Fleming	474	462		12	9,325
Floyd	1,421			1,421	5,750
Franklin	2,192	2,225	33		36,781
Fulton	450	457	7		3,440
Gallatin	487	562	75		9,871
Garrard	1,712	1,176		536	23,840
Grant	12	141	129		140
Graves	2,514	2,747	233		21,001
Grayson	1,004	1,045	41		4,115
Green	4,235	2,941		1,294	20,276
Greenup	711	710		1	3,610
Hancock	614	512		102	4,935
Hardin	1,961	1,435		526	14,130
Harlan	300	350	50		360
Harrison	1,165	1,113		52	14,000
Hart	4,075	3,961		114	23,350
Henderson	3,549	4,310	761		28,450
Henry	428	295		133	6,150
Hickman	646	963	317		5,790
Hopkins	2,260	2,809	549		10,880
Jackson	860	980	120		2,250
Jefferson	718	1,224	506		25,610
Jessamine	678	872	194		8,385
Johnson					
Kenton	9	16	7		550
Knox	1,525	1,529	4		2,360
Larue	1,029	1,020		9	8,663

NEGRO.—No. 4—Continued.

Value of land, 1877.	Increase.	Decrease.	Number town lots, 1876.	Number town lots, 1877.	Increase.	Decrease.
\$27,971		\$1,353				
6,956		2,357	6	4		2
3,695	\$515		15	26	11	
5,783		5,998	2	1		1
37,750	3,521		74	63		11
3,635	650		30	34	4	
820	75					
4,300	1,250		21	18		3
34,907	16,237		327	271		56
500			25	18		7
43,250		885	151	163	12	
12,655		590	7	11	4	
2,335		15				
18,360	540		8	12	4	
3,453	223		7	4		3
9,180		25	5	3		2
11,489		2,177	32	28		4
8,035	600		1	3	2	
1,370		12,410	5	4		1
6,190	3,690		17	24	7	
1,290		110	3	2		1
3,317	315					
38,185		6,965	59	88	29	
10,910		115	222	206		16
7,875		555				
750		50	2	2		
11,665	558		8	5		3
4,150	125		11	8		3
34,751		3,214	66	67	1	
15,989	2,879		1	1		
1,835		335	1	1		
580		258				
40,010	5,860		941	781		160
7,485		1,840	62	69	7	
		5,750				
37,507	726		153	209	56	
3,785	345		73	60		13
10,305	434		19	21	2	
15,895		7,945	53	34		19
1,485	1,345		6	3		3
19,841		1,160	36	32		4
3,470		645	8	11	3	
17,845		2,431	12	10		2
3,395		215	11	14	3	
5,200	265		2	3	1	
9,955		4,175	72	74	2	
550	190					
13,585		415	75	81	6	
21,009		2,341	23	25	2	
30,927	2,477		135	136	1	
4,305		1,845	44	33		11
9,104	3,314		44	44		
13,835	2,955		59	82	23	
2,325	75					
37,680	12,070		474	504	30	
13,080	4,695		136	183	47	
700	150		7	10	3	
2,705	345					
8,572		91	2	2		

NEGRO.—No. 4—Continued.

COUNTIES.	Acres of land, 1876.	Acres of land, 1877.	Increase.	Decrease.	Value of land, 1876.
Laurel	445	545	100		\$575
Lawrence	474	555	81		2,530
Lee	180	308	128		1,325
Letcher	200	170		30	783
Lewis	773	535		238	2,465
Lincoln	2,446	2,651	205		28,592
Livingston	1,053	1,165	112		6,810
Logan	4,781	5,608	827		24,755
Lyon	3,422	2,852		570	17,175
Madison	5,644	5,426		218	62,710
Magoffin	400	425	25		800
Marion	1,016	1,069	53		7,190
Marshall	854	634		220	3,270
Martin	4			4	100
Mason	517	649	132		12,675
McCracken	725	632		93	7,550
McLean	134	148	14		1,395
Meade	879	1,170	291		3,890
Menifee	952	952			1,106
Mercer	1,525	1,882	357		29,760
Metcalfe	1,548	1,126		422	9,947
Monroe	749	654		95	2,510
Montgomery	1,008	1,277	269		8,868
Morgan	170	260	90		300
Muhlenburg	5,282	5,389	107		28,565
Nelson	1,797	2,312	515		16,690
Nicholas	970	995	25		11,260
Ohio	2,349	2,511	162		14,544
Oldham	643	684	41		6,950
Owen	636	660	24		5,695
Owsley					
Pendleton	1,001	967		34	12,200
Perry	633	893	260		583
Pike	100	200	100		650
Powell	761	848	87		3,648
Pulaski	1,145	1,212	67		6,550
Robertson	514	557	43		5,625
Rockcastle	560	831	271		4,690
Rowan	50	83	33		800
Russell	364	575	211		2,130
Scott	680	778	98		15,325
Shelby	788	790	2		10,145
Simpson	1,103	1,079		24	7,713
Spencer	436	783	347		3,958
Taylor	4,518	4,991	473		32,238
Todd	5,682	5,635		47	33,865
Trigg	3,073	3,056		17	16,364
Trimble	156	191	35		1,600
Union	1,146	1,273	127		11,226
Warren	5,248	5,464	216		54,919
Washington	1,589	1,680	91		16,080
Wayne	720	1,347	627		2,135
Webster	2,559	2,136		423	13,330
Whitley	330	230		100	825
Wolfe	142	177	35		465
Woodford	853	998	145		21,775
Total	164,634	166,952	12,845	10,527	\$1,307,951

NEGRO.—No. 4—Continued.

Value of land, 1877.	Increase.	Decrease.	Number town lots, 1876.	Number town lots, 1877.	Increase.	Decrease.
\$800	\$225					
2,380		\$150				
1,830	* 505		2	2		
800	17					
2,287		178	5	3		2
31,872	3,280		68	96	28	
6,320		490	14	14		
27,250	2,495		121	113		8
13,748		3,429	10	8		2
66,760	4,050		81	86	5	
950	150					
7,405	215		80	81	1	
2,015		1,255	6	6		
		100		4	4	
14,145	1,470		104	108	4	
6,670		880	166	180	14	
1,695	300		22	20		2
7,439	3,549		8	14	6	
1,177	71					
26,477		3,283	154	90		64
5,922		4,025	1	1		
1,993		517				
6,630		2,238	130	140	10	
700	400					
27,190		1,375	18	26	8	
20,845	4,155		84	86	2	
11,040		220	33	37	4	
12,365		2,179	18	16		2
6,780		170	54	56	2	
5,502		193	9	15	6	
11,600		600	19	29	10	
1,017	434					
1,100	450		1	1		
3,728	80					
4,937		1,613	5	7	2	
5,895	270					
4,690				2	2	
1,200	400		4	2		2
3,555	1,425		1	1		
17,525	2,200		150	164	14	
10,710	565		176	170		6
8,619	906		34	32		2
4,635	677		10	11	1	
27,852		4,386	19	20	1	
34,585	720		45	58	13	
16,478	114		20	23	3	
2,850	1,250		4	5	1	
8,945		2,281	29	40	11	
44,285		10,634	169	156		13
18,527	2,447		23	20		3
2,805	670					
10,685		2,645	13	21	8	
350		475				
446		19				
24,700	2,925		152	185	33	
\$1,301,192	\$102,839	\$109,598	5,615	5,637	453	431

NEGRO.—No. 4—Continued.

COUNTIES.	Value of town lots, 1876.	Value of town lots, 1877.	Increase.	Decrease.	Horses and mares, 1876.
Adair					285
Allen	\$590	\$315		\$275	125
Anderson	2,800	2,840	\$40		72
Ballard	800	200		600	141
Barren	11,080	9,450		1,630	461
Bath	6,625	7,900	1,275		125
Bell					9
Boone	3,415	3,050		365	113
Bourbon	61,360	67,595	6,235		317
Boyd	8,000	8,100	100		8
Boyle	46,575	52,925	6,350		124
Bracken	950	1,715	765		77
Breathitt					10
Breckinridge	1,625	1,980	355		216
Bullitt	1,365	950		415	121
Butler	615	512		103	103
Caldwell	6,250	5,725		525	90
Calloway	200	275	75		62
Campbell	1,650	1,500		150	16
Carroll	4,775	4,595		180	48
Carter	500	300		200	8
Casey					98
Christian	20,800	21,420	620		571
Clark	43,795	42,110		1,685	204
Clay					49
Clinton	400	500	100		17
Crittenden	1,175	925		250	104
Cumberland	475	320		155	142
Daviess	18,275	17,725		550	283
Edmonson	100	100			45
Estill	250	100		150	26
Elliott					6
Fayette	255,950	195,950		60,000	140
Fleming	12,640	11,560		1,080	65
Floyd					11
Franklin	91,690	112,025	20,335		229
Fulton	7,535	7,475		60	73
Gallatin	3,975	4,775	800		77
Garrard	9,580	4,215		5,365	289
Grant	1,750	1,700		50	50
Graves	7,640	4,850		2,790	200
Grayson	1,075	1,175	100		44
Green	1,330	860		470	245
Greenup	3,800	3,950	150		36
Hancock	550	600	50		90
Hardin	12,795	7,995		4,800	193
Harlan					10
Harrison	22,550	20,570		1,980	226
Hart	3,375	3,066		309	330
Henderson	37,670	35,210		2,460	454
Henry	9,610	7,755		1,855	125
Hickman	4,425	3,385		1,040	77
Hopkins	8,200	9,620	1,420		202
Jackson					6
Jefferson	265,350	246,300		19,050	331
Jessamine	13,720	23,390	9,670		219
Johnson					
Kenton	1,250	2,400	1,150		17
Knox					52
Larue	250	350	100		99

NEGRO.—No. 4—Continued.

Horses and mares, 1877.	Increase.	Decrease.	Value of horses and mares, 1876.	Value of horses and mares, 1877.	Increase.	Decrease.
286	1	-----	\$11,451	\$11,640	\$189	-----
128	3	-----	4,735	4,680	-----	\$55
63	-----	9	2,020	1,610	-----	410
140	-----	1	6,362	5,835	-----	527
443	-----	18	16,395	16,370	-----	25
109	-----	16	4,370	3,235	-----	1,135
8	-----	1	320	285	-----	35
106	-----	7	4,635	4,242	-----	393
359	42	-----	10,205	10,615	410	-----
5	-----	3	375	135	-----	240
113	-----	11	4,780	4,305	-----	475
90	13	-----	2,775	3,260	485	-----
17	7	-----	460	685	225	-----
225	9	-----	10,290	9,920	-----	370
136	15	-----	4,601	4,563	-----	38
123	20	-----	4,051	4,470	419	-----
97	7	-----	4,555	4,312	-----	243
61	-----	1	2,010	1,865	-----	145
12	-----	4	840	650	-----	190
59	11	-----	2,150	2,060	-----	90
11	3	-----	282	450	168	-----
100	2	-----	3,813	3,670	-----	143
254	-----	317	22,625	21,605	-----	1,020
209	5	-----	5,925	5,295	-----	630
44	-----	5	2,067	1,760	-----	307
20	3	-----	730	805	75	-----
121	17	-----	4,152	4,910	758	-----
113	-----	29	5,150	4,055	-----	1,095
375	92	-----	16,450	14,725	-----	1,725
50	5	-----	2,260	2,355	95	-----
24	-----	2	840	790	-----	50
3	-----	3	260	120	-----	140
200	60	-----	6,500	7,200	700	-----
73	8	-----	2,390	2,840	450	-----
8	-----	3	550	395	-----	155
200	-----	29	8,980	7,048	-----	1,932
96	23	-----	3,515	3,355	-----	160
80	3	-----	3,650	3,765	115	-----
136	-----	153	10,095	4,105	-----	5,990
52	2	-----	1,985	1,850	-----	135
170	-----	30	9,570	6,265	-----	3,305
39	-----	5	1,865	1,290	-----	575
233	-----	12	7,640	5,860	-----	1,780
33	-----	3	1,685	1,585	-----	100
70	-----	20	4,610	3,380	-----	1,230
189	-----	4	7,645	6,550	-----	1,095
8	-----	2	435	390	-----	45
205	-----	21	7,830	6,540	-----	1,290
338	8	-----	12,788	11,942	-----	846
448	-----	6	16,523	15,910	-----	613
167	42	-----	4,740	4,565	-----	175
103	26	-----	2,890	3,470	580	-----
199	-----	3	6,725	6,190	-----	535
9	3	-----	285	380	95	-----
320	-----	11	13,770	12,790	-----	980
225	6	-----	6,935	6,785	-----	150
1	1	-----	-----	20	20	-----
30	13	-----	605	985	380	-----
55	3	-----	1,890	2,165	275	-----
96	-----	3	3,780	3,355	-----	425

NEGRO.—No. 4—Continued.

COUNTIES.	Value of town lots, 1876.	Value of town lots, 1877.	Increase.	Decrease.	Horses and mares, 1876.
Laurel					18
Lawrence					25
Lee	\$400	\$350		\$50	10
Letcher					4
Lewis	850	600		250	20
Lincoln	10,615	14,750	\$4,135		273
Livingston	2,160	1,430		730	95
Logan	22,315	19,405		2,910	356
Lyon	1,420	870		550	109
Madison	32,100	32,200	100		610
Magoffin					4
Marion	13,705	12,725		980	126
Marshall	35	30		5	29
Martin		100	100		1
Mason	19,415	17,380		2,035	202
McCracken	46,950	50,500	3,550		117
McLean	2,625	2,225		400	78
Meade	1,800	2,625	825		115
Menifee					4
Mercer	41,255	30,830		10,425	157
Metcalfe	300	300			129
Monroe					59
Montgomery	21,385	19,560		1,825	198
Morgan					4
Muhlenburg	5,300	6,150	850		140
Nelson	18,265	17,680		585	292
Nicholas	5,180	5,930	750		90
Ohio	3,565	3,085		480	160
Oldham	8,700	7,450		1,250	169
Owen	1,950	2,790	840		109
Owsley					
Pendleton	3,690	4,890	1,200		115
Perry					8
Pike	600	150		450	10
Powell					29
Pulaski	675	1,060	385		64
Robertson					35
Rockcastle		200	200		25
Rowan	775	250		525	4
Russell	200	200			66
Scott	38,175	38,525	350		317
Shelby	33,350	31,275		2,075	137
Simpson	5,515	4,925		590	177
Spencer	1,420	1,220		200	133
Taylor	3,730	4,480	750		187
Todd	8,835	11,270	2,435		240
Trigg	4,380	5,290	910		147
Trimble	600	1,050	450		36
Union	6,905	7,320	415		387
Warren	45,490	36,925		8,565	489
Washington	4,575	3,950		625	172
Wayne					52
Webster	1,165	1,085		80	169
Whitley					15
Wolfe					4
Woodford	33,080	34,145	1,065		280
Total	\$1,474,605	\$1,399,478	\$69,000	\$144,127	14,967

NEGRO.—No. 4—Continued.

Horses and mares, 1877.	Increase.	Decrease.	Value of horses and mares, 1876.	Value of horses and mares, 1877.	Increase.	Decrease.
20	2	-----	\$855	\$850	-----	\$5
17	-----	8	1,135	845	-----	290
9	-----	1	470	425	-----	45
4	-----	-----	210	180	-----	30
23	3	-----	845	970	\$125	-----
287	14	-----	9,160	9,665	505	*
93	-----	2	4,490	4,170	-----	320
380	24	-----	12,740	11,805	-----	935
97	-----	12	4,705	4,145	-----	560
607	-----	3	21,690	21,230	-----	460
4	-----	-----	225	150	-----	75
156	30	-----	3,170	3,925	755	-----
33	4	-----	1,150	1,385	235	-----
-----	-----	1	35	-----	-----	35
166	-----	36	6,965	5,785	-----	1,180
140	23	-----	4,850	5,840	990	-----
79	1	-----	3,682	3,295	-----	387
121	6	-----	5,135	4,630	-----	505
4	-----	-----	93	175	82	-----
154	-----	3	6,590	5,550	-----	1,040
94	-----	35	4,610	3,092	-----	1,518
58	-----	1	2,390	2,240	-----	150
185	-----	13	4,595	4,020	-----	575
2	-----	2	130	85	-----	45
147	7	-----	4,932	5,125	193	-----
321	29	-----	9,380	10,455	1,075	-----
97	7	-----	2,940	2,680	-----	260
169	9	-----	6,680	5,890	-----	790
184	15	-----	5,820	5,810	-----	10
134	25	-----	3,775	4,205	430	-----
3	3	-----	-----	185	185	-----
107	-----	8	5,560	4,660	-----	900
7	-----	1	340	265	-----	75
9	-----	1	519	585	66	-----
32	3	-----	925	1,035	110	-----
79	15	-----	2,587	2,731	144	-----
39	4	-----	1,485	1,335	-----	150
32	7	-----	1,055	1,270	215	-----
4	-----	-----	150	135	-----	15
47	-----	19	1,910	1,755	-----	155
419	102	-----	11,500	15,250	3,750	-----
158	21	-----	4,880	4,940	60	-----
203	26	-----	6,245	6,180	-----	65
134	1	-----	3,072	2,930	-----	142
193	6	-----	6,043	5,954	-----	89
281	41	-----	9,465	11,105	1,640	-----
169	22	-----	6,017	6,550	533	-----
56	20	-----	1,575	2,240	665	-----
351	-----	36	13,005	10,300	-----	2,705
517	28	-----	16,872	16,705	-----	167
193	21	-----	5,812	6,060	248	-----
49	-----	3	2,255	1,670	-----	585
151	-----	18	7,420	5,475	-----	1,945
14	-----	1	720	570	-----	150
1	-----	3	105	30	-----	75
216	-----	64	7,710	5,975	-----	1,735
14,936	972	1,003	\$562,484	\$530,764	\$17,445	\$49,165

NEGRO.—No. 4—Continued.

COUNTIES.	Mules, 1876.	Mules, 1877.	Increase.	Decrease.	Value of mules, 1876.
Adair	37	42	5		\$1,415
Allen	48	55	7		2,300
Anderson					
Ballard	98	128	30		5,035
Barren	96	91		5	3,760
Bath	9	1		8	195
Bell	1	1			40
Boone	7	9	2		270
Bourbon	13	8		5	445
Boyd		1	1		
Boyle	6	7	1		265
Bracken	3	3			130
Breathitt	4	3		1	220
Breckinridge	22	29	7		1,285
Bullitt	4	10	6		90
Butler	33	40	7		1,305
Caldwell	75	64		11	4,420
Calloway	56	60	4		3,065
Campbell	4	2		2	220
Carroll	6	5		1	155
Carter	1			1	35
Casey	2	6	4		70
Christian	552	301		251	24,145
Clark	6	9	3		190
Clay	13	20	7		760
Clinton	5	5			260
Crittenden	50	56	6		2,825
Cumberland	24	30	6		1,030
Daviess	99	98		1	5,385
Edmonson	24	32	8		1,441
Estill	1	4	3		15
Elliott					
Fayette	1	4	3		50
Fleming	1	2	1		25
Floyd	4	4			255
Franklin	13	7		6	405
Fulton	61	63	2		3,355
Gallatin	5	9	4		390
Garrard	46	20		26	1,520
Grant	1	1			40
Graves	110	166	56		5,865
Grayson	1	2	1		20
Green	49	43		6	1,620
Greenup	8	7		1	595
Hancock	6	9	3		270
Hardin	15	16	1		660
Harlan	1			1	50
Harrison	3	5	2		60
Hart	63	68	5		2,975
Henderson	269	244		25	11,450
Henry	2	4	2		80
Hickman	74	79	5		3,424
Hopkins	97	127	30		4,105
Jackson	7	7			300
Jefferson	56	78	22		3,020
Jessamine	6	8	2		235
Johnson					
Kenton		1	1		
Knox	12	11		1	545
Larue		3	3		

NEGRO.—No. 4—Continued.

Value of mules, 1877.	Increase.	Decrease.	Jennies, 1876.	Jennies, 1877.	Increase.	Decrease.
\$1,705	\$290		7	4		3
2,390	90		1	2	1	
6,110	1,075		1	3	2	
3,535		\$225	6	6		
15		180				
40						
410	140					
245		200				
25	25					
325	60					
90		40	1	1		
175		45	1	2	1	
1,285						
360	270					
1,847	542		1	1		
4,135		285	1	1		
2,900		165		2	2	
75		145				
175	20					
		35				
150	80		1			1
25,995	1,850		4	1		3
290	100					
1,165	405					
305	45					
3,035	210					
1,335	305			1	1	
4,960		425	1			1
1,516	75		2	1		1
76	61		2			2
100	50					
35	10		1			1
285	30					
212		193	1	5	4	
2,500		855				
600	210					
865		655				
40						
7,085	1,220			4	4	
65	45					
1,335		285	5	4		1
520		75				
465	195					
670	10					
		50				
165	105		2			2
2,630		345	2	4	2	
9,520		1,930	1	2	1	
145	65			1	1	
3,025		399	7	4		3
5,120	1,015			1	1	
370	70		1	3		
3,450	430					
350	115		2			2
40	40					
520		25				
105	105					

NEGRO.—No. 4—Continued.

COUNTIES.	Mules, 1876.	Mules, 1877.	Increase.	Decrease.	Value of mules, 1876.
Laurel	2	2			\$40
Lawrence		1	1		
Lee	2	1		1	40
Letcher					
Lewis					
Lincoln	15	23	8		585
Livingston	52	29		23	3,080
Logan	160	168	8		6,305
Lyon	69	89	20		3,485
Madison	49	48		1	2,050
Magoffin	2	2			150
Marion	1	3	2		25
Marshall	13	19	6		695
Martin	1	2	1		100
Mason	7	30	23		365
McCracken	111	110		1	5,180
McLean	8	12	4		400
Meade	22	27	5		780
Menifee					
Mercer	6	1		5	165
Metcalfe	16	15		1	513
Monroe	14	21	7		480
Montgomery	7	4		3	180
Morgan					
Muhlenburg	92	99	7		4,275
Nelson	22	23	1		845
Nicholas	2	4	2		70
Ohio	52	44		8	2,275
Oldham	3	5	2		115
Owen	6	15	9		160
Owsley					
Pendleton	2	2			40
Perry					
Pike		1	1		
Powell	8	13	5		160
Pulaski	25	24		1	1,050
Robertson					
Rockcastle	2	7	5		40
Rowan	4	3		1	175
Russell	7	7			345
Scott	12	14	2		650
Shelby	1	1			25
Simpson	54	45		9	1,825
Spencer	10	3		7	205
Taylor	35	40	5		1,325
Todd	254	269	15		11,365
Trigg	162	165	3		8,051
Trimble	1	1			10
Union	91	103	12		3,740
Warren	156	199	43		6,395
Washington	1	2	1		50
Wayne	3	5	2		150
Webster	61	95	34		3,205
Whitley	1	1			40
Wolfe					
Woodford	4	8	4		150
Total	3,838	3,913	488	413	\$173,439

NEGRO.—No. 4—Continued.

Value of mules, 1877.	Increase.	Decrease.	Jennies, 1876.	Jennies, 1877.	Increase.	Decrease.
\$40			3	1		2
30	\$30					
50	10					
			1			1
945	360		1			1
1,510		\$1,570	2	5	3	
6,145		160		2	2	
3,742	257		1			1
1,740		310	1	2	1	
150						
45	20		1			1
835	140					
125	25					
1,010	645					
5,435	255		12	1		11
480	80					
1,100	320					
40		125				
494		19	3	3		
782	302		2	2		
90		90				
4,450	175		1	1		
810		35	1	2	1	
100	30					
1,805		470	1			1
150	35			1	1	
430	270					
75	35					
75	75					
395	235		1	1		
855		195	1	1		
185	145			2	2	
110		65				
325		20				
525		125		4	4	
30	5					
1,450		375	1	1		
30		175				
1,430	105		1	2	1	
11,085		280				
7,195		856	1			1
15	5					
3,595		145	1			1
7,063	668		4	4		
35		15				
240	90					
4,375	1,170		1	1		
50	10					
255	75					
\$176,812	\$14,960	\$11,587	92	89	37	40

NEGRO.—No. 4—Continued.

COUNTIES.	Value of jennies, 1876.	Value of jennies, 1877.	Increase.	Decrease.	Cattle, 1876.
Adair -----	\$115	\$65		\$50	226
Allen -----	10	35	\$25		128
Anderson -----					
Ballard -----	5	25	20		253
Barren -----	57	70	13		157
Bath -----					21
Bell -----					36
Boone -----					11
Bourbon -----					
Boyd -----					21
Boyle -----					
Bracken -----	20			20	62
Breathitt -----	20	25	5		83
Breckinridge, -----					13
Bullitt -----					27
Butler -----	10	10			159
Caldwell -----	20	25	5		5
Calloway -----		25	25		103
Campbell -----					12
Carroll -----					13
Carter -----					12
Casey -----	20			20	79
Christian -----	40	50	10		130
Clark -----					3
Clay -----					157
Clinton -----					50
Crittenden -----					176
Cumberland -----		10	10		134
Daviess -----	20			20	235
Edmonson -----	56	20		36	78
Estill -----	30			30	53
Elliott -----					20
Fayette -----					12
Fleming -----	10			10	2
Floyd -----					36
Franklin -----	50	100	50		40
Fulton -----					41
Gallatin -----					12
Garrard -----					196
Grant -----					3
Graves -----		40	40		271
Grayson -----					49
Green -----	65	30		35	24
Greenup -----					35
Hancock -----					16
Hardin -----					109
Harlan -----					36
Harrison -----	40			40	55
Hart -----	50	105	55		378
Henderson -----	25	65	40		280
Henry -----		5	5		
Hickman -----	75	35		40	86
Hopkins -----		75	75		375
Jackson -----	15	60	45		43
Jefferson -----					20
Jessamine -----	20			20	7
Johnson -----					
Kenton -----					2
Knox -----					129
Larue -----					7

NEGRO.—No. 4—Continued.

Cattle, 1877.	Increase.	Decrease.	Value of cat- tle over \$50, 1876.	Value of cat- tle over \$50, 1877.	Increase.	Decrease.
257	31		\$185	\$215	\$30	
154	26		30	55	25	
219		34	575	425		\$150
119		38	75	65		10
18		3	270	165		105
36			15	10		5
6		5	75	50		25
19	19			235	235	
17		4	100	10		90
8	8			50	50	
56		6	85	100	15	
86	3		130	90		40
18	5		95	125	30	
90	63		100	105	5	
67		92	400	376		24
60	55		50	69	19	
161	58			10	10	
		12	145			145
6		7	110	100		10
7		5	165	100		55
64		15	120	110		10
31		99	90	120	30	
4	1			10	10	
151		6	360	245		115
49		1	25	50	25	
195	19		268	365	97	
88		46	120	125	5	
137		98	755	550		205
87	9		382	440	58	
35		18	160	50		110
4		16	112			112
8		4	200	200		
		2				
40	4		30	25		5
50	10		535	1,238	703	
40		1	300	200		100
36	24		205	300	95	
68		128	235	135		100
7	4		67	90	23	
202		69	115	180	65	
36		13	100	110	10	
15		9	135	75		60
21		14	175	150		25
		16	135			135
62		47	175	165		10
24		12	25			25
17		38	10			10
349		29	466	285		181
179		101	435	145		290
26	26			330	330	
73		13	595	610	15	
423	48		240	160		80
54	11		75	180	105	
26	6		245	185		60
		7	50			50
1	1					
1		1				
134	5		85	151	66	
4		3	20	25	5	

NEGRO.—No. 4—Continued.

COUNTIES.	Value of jennies, 1876.	Value of jennies, 1877.	Increase.	Decrease.	Cattle, 1876.
Laurel	\$60	\$5		\$55	49
Lawrence					36
Lee					23
Letcher	5			5	26
Lewis					24
Lincoln	20			20	51
Livingston	35	35			225
Logan		15	\$15		323
Lyon	10			10	214
Madison	10	20	10		146
Magoffin					13
Marion	20			20	71
Marshall					79
Martin					4
Mason					8
McCracken		10	10		99
McLean					52
Meade					22
Menifee					
Mercer					
Metcalfe	40	40			87
Monroe	45	15		30	124
Montgomery					7
Morgan					5
Muhlenburg	10	5		5	300
Nelson	10	25	15		35
Nicholas					9
Ohio	10			10	252
Oldham		10	10		5
Owen					9
Owsley					3
Pendleton					65
Perry					61
Pike					
Powell	5	5			30
Pulaski	80	5		75	146
Robertson					25
Rockcastle		35	35		68
Rowan					4
Russell					81
Scott		25	25		29
Shelby					
Simpson	25	10		15	26
Spencer					17
Taylor	20	20			191
Todd					46
Trigg	10			10	154
Trimble					1
Union	25			25	92
Warren	80	40		40	160
Washington					45
Wayne					99
Webster		25	25		46
Whitley					48
Wolfe					9
Woodford					
Total	\$1,293	\$1,220	\$568	\$641	8,465

NEGRO.—No. 4—Continued.

Cattle, 1877.	Increase.	Decrease.	Value of cat- tle over \$50, 1876.	Value of cat- tle over \$50, 1877.	Increase.	Decrease.
41		8	\$25	\$15		\$10
40	4			15	\$15	
29	6		43	40		3
35	9			15	15	
33	9		180	145		35
57	6		510	680	170	
149		76	490	290		200
266		57	105	90		15
251	37		416	268		148
111		35	1,660	1,650		10
24	11			450	450	
83	12			10	10	
91	12		60	65	5	
4						
7		1	50	15		35
2		97	25	40	15	
34		18				
28	6		225	222		3
3	3					
83		4	145	92		53
96		28	85			85
3		4	20	10		10
21	16			150	150	
288		12	80	75		5
35			200	270	70	
6		3	80	50		30
260	8		145	175	30	
7	2		25	75	50	
1		8	40	10		30
7	4					
58		7	80	10		70
58		3	140	130		10
33	3		90	100	10	
133		13	121	111		10
25			160	125		35
92	24		115	105		10
4			10	40	30	
67		14	110	230	120	
30	1		600	700	100	
		26	10			10
13		4	145	185	40	
165		26	190	198	8	
114	68		135	110		25
92		62	85	110	25	
10	9			100	100	
18		74	465	85		380
289	129		135	365	230	
47	2		625	625		
58		41	125	145	20	
17		29	75	80	5	
34		14	120	50		70
12	3					
			405	170		235
7,609	820	1,676	\$18,190	\$18,050	\$3,729	\$3,869

NEGRO.—No. 4—Continued.

COUNTIES.	Stores, 1876.	Stores, 1877.	Increase.	Decrease.	Value of stores, 1876.
Adair					
Allen					
Anderson					
Ballard	1	1			\$500
Barren					
Bath					
Bell					
Boone					
Bourbon	4	2		2	395
Boyd					
Boyle	4	5	1		725
Bracken					
Breathitt					
Breckinridge					
Bullitt					
Butler					
Caldwell					
Calloway					
Campbell					
Carroll					
Carter					
Casey					
Christian	3	3			1,140
Clark	5	5			825
Clay					
Clinton					
Crittenden					
Cumberland					
Daviess	1	1			200
Edmonson					
Estill					
Elliott					
Fayette	5	7	2		600
Fleming					
Floyd					
Franklin	2	1		1	480
Fulton					
Gallatin					
Garrard	1	1			130
Grant					
Graves	3	1		2	285
Grayson					
Green					
Greenup					
Hancock					
Hardin					
Harlan					
Harrison					
Hart					
Henderson	1	2	1		75
Henry		1	1		
Hickman	1			1	50
Hopkins		1	1		
Jackson					
Jefferson	9	5		4	4,300
Jessamine		1	1		
Johnson					
Kenton					
Knox					
Larue					

NEGRO.—No. 4—Continued.

Value of stores, 1877.	Increase.	Decrease.	Value under the equalization law, 1876.	Value under the equalization law, 1877.	Increase.	Decrease.
			\$1,610	\$50		\$1,560
			186	336	\$150	
\$500			75			75
			200	500	300	
			52			52
			653	200		453
215		\$180	4,145	3,775		370
			2,584	2,215		369
675		50	550	500		50
			240			240
			850	50		800
				100	100	
			604	400		204
				40	40	
			90	100	10	
			2,500	1,400		1,100
			100			100
925		215	1,570	1,000		570
525		300	3,400	3,950	550	
				75	75	
200			785	90		695
			1,150			1,150
			20			20
600			3,600	600		3,000
			3,500	2,350		1,150
600	\$120		1,640	1,830	190	
			625			625
			600	1,500	900	
140	10		1,050	1,000		50
			50			50
50		235		240	240	
			90	10		80
			300	200		100
			2,125	1,600		525
			1,050	700		350
			3,140	3,270	130	
				550	550	
250	175		930	400		530
20	20		1,300	1,477	177	
		50	100	25		75
600	600		300	200		100
2,400		1,900	6,953	1,900		5,053
100	100		180	2,300	2,120	
			2,610	2,500		110
			200			200

NEGRO.—No. 4—Continued.

COUNTIES.	Stores, 1876.	Stores, 1877.	Increase.	Decrease.	Value of stores, 1876.
Laurel					
Lawrence					
Lee					
Letcher					
Lewis					
Lincoln	1	3	2		\$300
Livingston					
Logan	3	1		2	390
Lyon	1	1			100
Madison	1	2	1		50
Magoffin					
Marion		1	1		
Marshall					
Martin					
Mason		1	1		
McCracken		2	2		
McLean					
Meade		2	2		
Menifee					
Mercer	4	5	1		370
Metcalfe					
Monroe					
Montgomery	3			3	206
Morgan					
Muhlenburg					
Nelson					
Nicholas					
Ohio					
Oldham					
Owen					
Owsley					
Pendleton					
Perry					
Pike					
Powell					
Pulaski					
Robertson					
Rockcastle					
Rowan					
Russell					
Scott	1			1	50
Shelby					
Simpson					
Spencer					
Taylor	1	1			50
Todd					
Trigg					
Trimble					
Union		1	1		
Warren					
Washington					
Wayne					
Webster					
Whitley					
Wolfe					
Woodford	5	4		1	450
Total	60	61	18	17	\$11,665

NEGRO.—No. 4—Continued.

Value of stores, 1877.	Increase.	Decrease.	Value under the equalization law, 1876.	Value under the equalization law, 1877.	Increase.	Decrease.
			\$200	\$200		
			300	400	\$100	
\$260		\$40				
50		340	550			\$550
75		25	50	30		20
130	\$80		3,860	3,970	110	
25	25		400	2,460	2,060	
			200			200
100	100		3,550	2,900		650
100	100		1,670	1,750	80	
5,000	5,000		200	1,200	1,000	
120		250	140	140		
			3,150	2,200		950
			185	41		144
			350	300		50
		200	4,346	2,510		1,836
			600	200		400
			5,629	3,730		1,899
			1,340	1,250		90
			779	100		679
			825	800		25
			100			100
			200	200		
			400			400
			600	550		50
		50	1,550	1,500		50
			3,910	3,300		610
			300	492	192	
			1,280	1,300	20	
75	25		995	955		40
			150	75		75
			400			400
			100	175	75	
10	10		73	150	77	
			1,245	1,275	30	
			5,565	5,500		65
			1,170	1,485	315	
			100			100
240		210	3,100	3,200	100	
\$13,985	\$6,365	\$4,045	\$101,269	\$81,771	\$9,691	\$29,189

NEGRO.—No. 4—Continued.

COUNTIES.	Value of car- riages, &c., 1876.	Value of car- riages, &c., 1877.	Increase.	Decrease.	Value of gold & sil- ver watches, gold & silver plate, pianos, &c., 1876.
Adair		\$10	\$10		\$36
Allen	\$10	70	60		110
Anderson	30	70	40		
Ballard	270	180		\$90	139
Barrèr	80	125	45		95
Bath					
Bell					
Boone	75	60		15	
Bourbon	475	520	45		25
Boyd					147
Boyle	75	25		50	55
Bracken	75	35		40	40
Breathitt					
Breckinridge					45
Bullitt		10	10		69
Butler					111
Caldwell	20	50	30		73
Calloway	40	25		15	145
Campbell	30			30	502
Carroll	55	15		40	10
Carter					36
Casey	40	35		5	41
Christian	290	400	110		425
Clark	30	30			55
Clay					38
Clinton					
Crittenden	15	10		5	89
Cumberland	15			15	17
Daviess	837	785		52	483
Edmonson	20			20	30
Estill					
Elliott					
Fayette	150	650	500		
Fleming	180			180	20
Floyd					
Franklin	869	908	39		758
Fulton	105	150	45		105
Gallatin					
Garrard	305	110		195	275
Grant	25	30	5		
Graves	99	93		6	412
Grayson					25
Green					10
Greenup	50	20		30	145
Hancock	10	120	110		40
Hardin	125			125	150
Harlan					5
Harrison	140	80		60	60
Hart	15	137	122		43
Henderson	620	420		200	280
Henry	65	350	285		30
Hickman	60	55		5	148
Hopkins	205	90		115	96
Jackson					
Jefferson	125	75		50	500
Jessamine	620	95		525	
Johnson					
Kenton					20
Knox					
Larue					

NEGRO.—No. 4—Continued.

Value of gold & silver watches, gold & silver plate pianos, &c., 1877.	Increase.	Decrease.	Total valuation, 1876.	Total valuation, 1877.	Increase.	Decrease.
\$27		\$9	\$44,136	\$41,683		\$2,453
90		20	17,284	14,927		2,357
			8,030	8,215	\$185	
145	\$6		25,542	19,203		6,339
80		15	65,771	67,445	1,674	
			14,645	15,450	805	
			1,172	1,155		17
			12,173	12,312	139	
145	120		95,720	118,252	22,532	
124		23	11,706	11,109		597
		55	97,160	102,055	4,895	
85	45		17,560	17,940	380	
			3,180	3,310	130	
80	35		32,010	31,800		210
122	53		9,455	9,663	208	
140	29		16,301	16,935	634	
67		6	29,054	25,912		3,142
120		25	12,985	13,355	370	
		502	17,167	3,595		13,572
10			12,255	14,545	2,290	
24		12	2,408	2,164		244
12		29	7,206	7,294	88	
185		240	116,275	109,885		6,390
		55	65,245	63,120		2,125
54	16		11,655	11,099		556
			2,215	2,485	270	
119	30		19,631	21,029	1,398	
9		8	10,832	10,004		828
117		366	81,155	73,903		7,252
39	9		18,549	20,459	1,910	
5	5		3,465	2,856		609
			1,230	700		530
			301,200	245,310		55,890
		20	28,090	24,270		3,820
			6,585	705		5,880
305		453	142,188	161,773	19,585	
45		60	18,980	17,510		1,470
85	85		18,691	21,330	2,639	
20		255	47,030	26,485		20,545
10	10		4,057	5,205	1,148	
536	124		44,987	39,180		5,807
30	5		7,290	6,150		1,140
25	15		31,376	26,230		5,146
69		76	12,185	11,289		896
10		30	10,550	9,775		775
10		140	36,730	26,045		10,685
		5	875	940	65	
55		5	47,830	44,265		3,565
58	15		43,062	39,782		3,280
441	161		96,459	93,288		3,171
90	60		21,975	19,042		2,933
131		17	17,557	19,840	2,283	
320	224		30,751	36,210	5,459	
			2,925	3,315	390	
470		30	319,873	305,250		14,623
85	85		30,145	46,185	16,040	
				20	20	
15		5	5,035	6,640	1,605	
13	13		4,880	5,554	674	
			12,913	12,407		506

NEGRO.—No. 4—Continued.

COUNTIES.	Value of carriages, &c., 1876.	Value of carriages, &c., 1877.	Increase.	Decrease.	Value of gold & silver watches, gold & silver plate, pianos, &c., 1876.
Laurel					\$5
Lawrence					8
Lee					100
Letcher					6
Lewis					43
Lincoln	\$165	\$110		\$55	40
Livingston					15
Logan	275	200		75	55
Lyon	150	110		40	234
Madison	240	150		90	10
Magoffin					
Marion					50
Marshall					38
Martin					14
Mason	65	20		45	5
McCracken	250	985	\$735		390
McLean		60	60		55
Meade	35	100	65		73
Menifee					
Mercer	490	415		75	245
Metcalfe	30	60	30		215
Monroe	40			40	20
Montgomery					32
Morgan					6
Muhlenburg	70	230	160		287
Nelson	50			50	195
Nicholas					
Ohio	30	15		15	160
Oldham		25	25		25
Owen	125			125	
Owsley					
Pendleton		15	15		20
Perry					
Pike					9
Powell					
Pulaski	15	20	5		9
Robertson					20
Rockcastle					30
Rowan					
Russell					
Scott	200	350	150		
Shelby	85	95	10		
Simpson	181	75		106	166
Spencer					
Taylor	10	2		8	107
Todd	965	590		375	95
Trigg	290	310	20		114
Trimble		15	15		10
Union	224	210		14	601
Warren	150	275	125		204
Washington					
Wayne					
Webster	25	35	10		30
Whitley					
Wolfe					
Woodford	650	320		330	195
Total	\$11,060	\$10,630	\$2,881	\$3,311	\$9,874

NEGRO.—No. 4—Continued.

Value of gold & silver watches, gold & silver plate pianos, &c., 1877.	Increase.	Decrease.	Total valuation, 1876.	Total valuation, 1877.	Increase.	Decrease.
		\$5	\$1,560	\$1,710	\$150	
\$9	\$1		3,673	3,279		\$394
60		40	2,578	2,955	377	
6			1,004	1,001		3
15		28	4,683	4,417		266
35		5	49,987	58,317	8,330	
20	5		17,080	13,775		3,305
105	50		67,490	65,065		2,425
110		124	27,745	23,098		4,647
20	10		124,380	127,870	3,490	
			1,175	1,700	525	
75	25		24,560	26,670	2,110	
16		22	5,248	4,346		902
		14	449	225		224
		5	43,090	41,355		1,735
440	50		66,865	71,770	4,905	
5		50	8,157	7,760		397
53		20	12,138	22,369	10,231	
			1,339	1,492	153	
80		165	82,025	65,712		16,313
70		145	15,985	10,111		5,874
10		10	5,920	5,340		580
40	8		39,626	32,860		6,766
		6	436	935	499	
182		105	44,119	43,607		512
280	85		51,264	54,095	2,831	
10	10		20,870	21,060	190	
98		62	28,188	23,533		4,655
		25	22,460	21,100		1,360
5	5		11,845	12,942	1,097	
				185	185	
10		10	21,790	21,460		330
			1,063	1,412	349	
5		4	1,778	1,915	137	
3	3		4,828	5,266	438	
20	11		11,087	9,739		1,348
5		15	7,290	7,360	70	
35	5		5,930	6,520	590	
			2,310	1,735		575
			5,295	6,615	1,320	
			68,050	74,400	6,350	
			52,395	50,350		2,045
107		59	21,980	21,858		122
			10,080	10,300	220	
169	62		44,708	41,135		3,573
70		25	64,875	68,890	4,015	
63		51	35,711	35,996	285	
15	5		3,895	6,460	2,565	
192		409	36,264	30,807		5,457
277	73		125,490	107,210		18,280
			32,707	34,697	1,990	
			4,665	4,860	195	
40	10		26,420	23,285		3,135
10	10		1,805	1,030		775
			570	476		94
80		115	67,515	69,085	1,570	
\$7,467	\$1,573	\$3,980	\$3,671,831	\$3,541,369	\$142,983	\$273,445

NEGRO.—No. 4—Continued.

COUNTIES.	Tax on valuation at 45 cts. per \$100, 1876.	Tax on valuation at 45 cts. per \$100, 1877.	Increase.	Decrease.	Auditor's list, 1876.
Adair	\$198 61	\$187 57		\$11 04	
Allen	77 78	67 17		10 61	
Anderson	36 18	36 97	\$0 84		
Ballard	114 94	86 42		28 52	
Barren	295 97	303 50	7 53		
Bath	65 90	69 52	3 62		
Bell	5 27	5 20		7	
Boone	54 78	55 40	62		
Bourbon	430 74	532 13	101 39		
Boyd	52 68	49 99		2 69	
Boyle	437 22	459 25	22 03		
Bracken	79 02	80 73	1 71		
Breathitt	14 31	14 89	58		
Breckinridge	144 05	143 10		95	
Bullitt	42 55	43 48	93		
Butler	73 35	76 22	2 87		
Caldwell	130 74	116 60		14 14	
Calloway	58 43	60 10	1 67		
Campbell	77 25	16 18		61 07	
Carroll	55 15	65 45	10 30		
Carter	10 84	9 74		1 10	
Casey	32 43	32 82	39		
Christian	523 24	494 48		28 76	
Clark	293 60	284 04		9 56	
Clay	52 45	49 95		2 50	
Clinton	9 97	11 18	1 21		
Crittenden	88 34	94 63	6 29		
Cumberland	48 74	45 02		3 72	
Daviess	365 20	332 56		32 64	
Edmonson	83 46	92 07	8 61		
Estill	15 59	12 86		2 73	
Elliott	5 53	3 15		2 38	
Fayette	1,355 40	1,103 89		251 51	
Fleming	126 40	109 22		17 18	
Floyd	29 63	3 18		26 45	
Franklin	639 85	727 98	88 13		
Fulton	85 41	78 79		6 62	
Gallatin	84 12	95 98	11 86		
Garrard	211 63	119 19		92 44	
Grant	18 26	23 42	5 16		
Graves	202 45	176 31		26 14	
Grayson	32 80	27 67		5 13	
Green	141 19	118 03		23 16	
Greenup	54 83	50 80		4 03	
Hancock	47 47	43 99		3 48	
Hardin	165 28	117 20		48 08	
Harlan	3 94	4 23	29		
Harrison	215 23	199 19		16 04	
Hart	193 78	179 02		14 76	
Henderson	434 07	419 80		14 27	
Henry	98 89	85 69		13 20	
Hickman	79 01	89 28	10 27		
Hopkins	138 38	162 94	24 56		
Jackson	13 16	14 92	1 76		
Jefferson	1,439 43	1,373 62		65 81	
Jessamine	135 65	207 85	72 20		
Johnson		9	9		
Kenton	22 66	29 88	7 22		
Knox	21 96	24 99	3 03		
Larue	58 11	55 83		2 28	

NEGRO.—No. 4—Continued.

Auditor's list, 1877.	Increase.	Decrease.	Total tax, 1876.	Total tax, 1877.	Increase.	Decrease.
			\$198 61	\$187 57		\$11 04
			77 78	67 17		10 61
			36 13	36 97	\$0 84	
			114 94	86 42		28 52
			295 97	303 50	7 53	
			65 90	69 52	3 62	
			5 27	5 20		7
			54 78	55 40	62	
			430 74	532 13	101 39	
			52 68	49 99		2 69
			437 22	459 25	22 03	
			79 02	86 73	1 71	
			14 31	14 89	58	
			144 05	143 10		95
			42 55	43 48	93	
			73 35	76 22	2 87	
			130 74	116 60		14 14
			58 43	60 10	1 67	
			77 25	16 18		61 07
			55 15	65 45	10 30	
			10 84	9 74		1 10
			32 43	32 82	39	
			523 24	494 48		28 76
			293 60	284 04		9 56
			52 45	49 95		2 50
			9 97	11 18	1 21	
			88 34	94 63	6 29	
			48 74	45 02		3 72
			365 20	332 56		32 64
			83 46	92 07	8 61	
			15 59	12 86		2 73
			5 53	3 15		2 38
			1,355 40	1,103 89		251 51
			126 40	109 22		17 18
			29 63	3 18		26 45
			639 85	727 98	88 13	
			85 41	78 79		6 62
			84 12	95 98	11 86	
			211 63	119 19		92 44
			18 26	23 42	5 16	
			202 45	176 31		26 14
			32 80	27 67		5 13
			141 19	118 03		23 16
			54 83	50 80		4 03
			47 47	43 99		3 48
			165 28	117 20		48 08
			3 94	4 23	29	
			215 23	199 19		16 04
			193 78	179 02		14 76
			434 07	419 80		14 27
			98 89	85 69		13 20
			79 01	89 28	10 27	
			138 38	162 94	24 56	
			13 16	14 92	1 76	
			1,439 43	1,373 62		65 81
			135 65	207 85	72 20	
				9		
			22 66	29 88	7 22	
			21 96	24 99	3 03	
			58 11	55 83		2 28

NEGRO.—No. 4—Continued.

COUNTIES.	Tax on valuation at 45 cts. per \$100, 1876.	Tax on valuation at 45 cts. per \$100, 1877.	Increase.	Decrease.	Auditor's list, 1876.
Laurel	\$7 02	\$7 69	\$0 67		
Lawrence	16 53	14 76		\$1 77	
Lee	11 60	13 30	1 70		
Letcher	4 52	4 50		2	
Lewis	21 07	19 88		1 19	
Lincoln	224 94	262 43	37 49		
Livingston	76 86	61 99		14 87	
Logan	303 70	292 79		10 91	
Lyon	124 85	103 94		20 91	
Madison	559 72	575 41	15 69		
Magoffin	5 29	7 65	2 36		
Marion	110 52	120 01	9 49		
Marshall	23 62	19 56		4 06	
Martin	2 02	1 01		1 01	
Mason	193 90	186 10		7 80	
McCracken	300 89	322 96	22 07		
McLean	26 71	34 92		1 79	
Meade	54 62	100 66	46 04		
Menifee	6 03	6 71	68		
Mercer	369 10	295 71		73 39	
Metcalfe	71 93	45 50		26 43	
Monroe	26 64	24 03		2 61	
Montgomery	178 32	147 87		30 45	
Morgan	1 96	4 20	2 24		
Muhlenburg	198 53	196 23		2 30	
Nelson	230 69	243 43	12 74		
Nicholas	93 91	94 77	86		
Ohio	126 85	105 90		20 95	
Oldham	101 07	94 95		6 12	
Owen	53 30	58 24	4 94		
Owsley		83	83		
Pendleton	98 05	96 57		1 48	
Perry	4 78	6 35	1 57		
Pike	8 00	8 62	62		
Powell	21 73	23 70	97		
Pulaski	49 89	43 83		6 06	
Robertson	32 80	33 12	32		
Rockcastle	26 68	29 34	2 66		
Rowan	10 39	7 80		2 59	
Russell	23 85	29 77	5 92		
Scott	306 22	334 80	28 58		
Shelby	235 78	226 57		9 21	
Simpson	98 91	98 36		55	
Spencer	45 36	46 35	99		
Taylor	201 19	185 12		16 07	
Todd	291 94	310 00	18 06		
Trigg	160 70	161 98	1 28		
Trimble	17 53	29 07	11 54		
Union	163 19	138 63		24 56	
Warren	564 70	482 44		82 26	
Washington	147 18	156 15	8 97		
Wayne	20 89	21 87	98		
Webster	118 89	104 78		14 11	
Whitley	8 12	4 63		3 49	
Wolfe	2 56	2 15		41	
Woodford	303 83	310 88	7 05		
Total	\$16,523 22	\$15,936 16	\$643 47	\$1,230 43	

NEGRO.—No. 4—Continued.

Auditor's list, 1877.	Increase.	Decrease.	Total tax, 1876.	Total tax, 1877.	Increase.	Decrease.
			\$7 02	\$7 69	\$0 67	
			16 53	14 76		\$1 77
			11 60	13 30	1 70	
			4 52	4 50		2
			21 07	19 88		1 19
			224 94	262 43	37 49	
			76 86	61 99		14 87
			303 70	292 79		10 94
			124 85	103 94		20 94
			559 72	575 41	15 69	
			5 29	7 65	2 36	
			110 52	120 01	9 49	
			23 62	19 56		4 06
			2 02	1 01		1 04
			193 90	186 10		7 80
			300 89	322 96	22 07	
			36 71	34 92		1 79
			54 62	100 66	46 04	
			6 03	6 71	68	
			369 10	295 71		73 39
			71 93	45 50		26 43
			26 64	24 03		2 61
			178 32	147 87		30 45
			1 96	4 20	2 24	
			198 53	196 23		2 30
			230 69	243 43	12 74	
			93 91	94 77	86	
			126 85	105 90		20 95
			101 07	94 95		6 12
			53 30	58 24	4 94	
				83	83	
			98 05	96 57		1 48
			4 78	6 35	1 57	
			8 00	8 62	62	
			21 73	23 70	1 97	
			49 89	43 83		6 06
			32 80	33 12	32	
			26 68	29 34	2 66	
			10 39	7 80		2 59
			23 85	29 77	5 92	
			306 22	334 80	28 58	
			235 78	226 57		9 21
			98 91	98 36		55
			45 36	46 35	99	
			201 19	185 12		16 07
			291 94	310 00	18 06	
			160 70	161 98	1 28	
			17 53	29 07	11 54	
			163 19	138 63		24 56
			564 70	482 44		82 26
			147 18	156 15	8 97	
			20 89	21 87	98	
			118 89	104 78		14 11
			8 12	4 63		3 49
			2 56	2 15		41
			303 83	310 88	7 05	
			\$16,523 23	\$15,936 16	\$643 47	\$1,230 43

NEGRO.—No. 4—Continued.

COUNTIES.	Black males over 21 years of age, 1876.	Black males over 21 years of age, 1877.	Increase.	Decrease.	Legal voters, 1876.
Adair	338	379	41		338
Allen	216	211		5	208
Anderson	229	235	6		229
Ballard	266	326	60		254
Barren	816	850	34		816
Bath	322	365	43		326
Bell	20	23	3		23
Boone	244	253	9		241
Bourbon	1,172	1,363	191		1,172
Boyd	94	95	1		99
Boyle	920	980	60		920
Bracken	98	115	17		96
Breathitt	35	31		4	37
Breckinridge	309	354	45		309
Bullitt	191	203	12		191
Butler	121	131	10		122
Caldwell	314	310		4	314
Calloway	141	148	7		145
Campbell	95	84		11	95
Carroll	118	121	3		118
Carter	41	30		11	41
Casey	109	107		2	109
Christian	2,575	2,601	26		2,548
Clark	1,041	938		103	1,041
Clay	85	72		13	85
Clinton	52	47		5	57
Crittenden	198	206	8		192
Cumberland	265	249		16	267
Daviess	1,054	860		194	1,048
Edmonson	83	89	6		83
Estill	71	65		6	71
Elliott	7	6		1	7
Fayette	3,738	4,106	368		3,738
Fleming	257	262	5		257
Floyd	17	16		1	17
Franklin	672	697	25		672
Fulton	272	277	5		154
Gallatin	158	122		36	158
Garrard	650	392		258	650
Grant	254	146		108	254
Graves	450	468	18		449
Grayson	62	65	3		62
Green	365	387	22		367
Greenup	94	82		12	86
Hancock	139	141	2		139
Hardin	423	415		8	423
Harlan	14	13		1	14
Harrison	539	511		28	540
Hart	465	470	5		464
Henderson	1,305	1,432	127		1,279
Henry	441	413		28	441
Hickman	365	391	26		364
Hopkins	413	451	38		411
Jackson	17	17			17
Jefferson	8,294	7,414		880	8,020
Jessamine	701	886	185		701
Johnson	1	3	2		1
Kenton	701	816	115		701
Knox	91	97	6		99
Larue	154	159	5		159

NEGRO.—No. 4—Continued.

Legal voters, 1877.	Increase.	Decrease.	Children be- tween 6 & 20 years old, '76.	Children be- tween 6 & 20 years old, '77.	Increase.	Decrease.
379	41		618	640	22	
203		5	332	325		7
235	6		278	303	25	
315	61		238	279	41	
850	34		797	738		59
365	39		473	478	5	
23			45	37		8
252	11		68	44		24
1,363	191		874	994	120	
98		1	97	95		2
980	60		545	484		61
113	17		132	169	37	
32		5	65	53		12
357	48		311	299		12
203	12		216	237	21	
131	9		137	134		3
129		185	316	369	53	
153	8		295	326	31	
84		11	68	65		3
121	3		132	128		4
30		11	32	24		8
107		2	148	125		23
2,601	53		3,039	2,740		299
938		103	752	761	9	
79		6	145	142		3
49		8	66	82	16	
209	17		250	280	30	
255		12		85	85	
860		188	965	782		183
89	6		99	101	2	
66		5				
6		1	11	12	1	
4,106	368		525	530	5	
264	7		246	273	27	
18	1		41	36		5
697	25		741	652		89
199	45		279	249		30
122		36	90	87		3
392		258	685	230		455
147		107	74			74
467	18		177	431	254	
65	3		74	88	14	
392	25		517	502		15
84		2	2			2
141	2		174	176	2	
416		7	59	204	145	
13		1				
511		29	532	456		76
470	6		646	674	28	
1,429	150		1,089	2,228	1,139	
413		28	4			4
385	21		151	423	272	
441	30		582	623	41	
17			38	34		4
7,033		987	8,131	4,543		3,588
886	185		559	841	282	
3	2					
807	106		662	680	18	
103	4		140	161	21	
162	3		125	130	5	

NEGRO.—No. 4—Continued.

COUNTIES.	Black males over 21 years of age, 1876.	Black males over 21 years of age, 1877.	Increase.	Decrease.	Legal voters, 1876.
Laurel	29	32	3		34
Lawrence	35	30		5	38
Lee	27	31	4		27
Letcher	15	16	1		15
Lewis	41	39		2	41
Lincoln	856	860	4		857
Livingston	176	160		16	186
Logan	1,238	1,184		54	1,149
Lyon	347	378	31		345
Madison	1,238	1,259	21		1,239
Magoffin	8	9	1		8
Marion	599	617	18		599
Marshall	55	66	11		56
Martin	1	1			2
Mason	647	667	20		650
McCracken	962	970	8		961
McLean	130	128		2	129
Meade	180	190	10		180
Menifee	6	9	3		6
Mercer	686	543		143	686
Metcalfe	183	149		34	183
Monroe	109	98		11	109
Montgomery	596	682	86		596
Morgan	10	8		2	10
Muhlenburg	353	395	42		353
Nelson	776	831	55		776
Nicholas	229	243	14		229
Ohio	243	231		12	264
Oldham	338	373	35		338
Owen	179	220	41		176
Owsley	8	11	3		9
Pendleton	159	157		2	159
Perry	22	21		1	23
Pike	21	22	1		21
Powell	42	56	14		42
Pulaski	152	163	11		160
Robertson	57	54		3	57
Rockcastle	89	101	12		92
Rowan	10	7		3	11
Russell	58	65	7		58
Scott	958	1,059	101		957
Shelby	836	924	88		836
Simpson	502	487		15	502
Spencer	314	316	2		314
Taylor	329	345	16		329
Todd	1,022	1,145	123		1,020
Trigg	719	624		95	725
Trimble	80	96	16		80
Union	563	561		2	561
Warren	1,490	1,465		25	1,395
Washington	491	479		12	493
Wayne	127	110		17	127
Webster	237	260	23		237
Whitley	31	42	11		33
Wolfe	8	8			9
Woodford	1,163	1,177	14		1,163
Total	52,472	52,670	2,389	2,191	51,894

NEGRO.—No. 4—Continued.

Legal voters, 1877.	Increase.	Decrease.	Children be- tween 6 & 20 years old, '76.	Children be- tween 6 & 20 years old, '77.	Increase.	Decrease.
32	-----	2	45	40	-----	5
34	-----	4	50	47	-----	3
33	6	-----	21	31	10	-----
16	1	-----	18	34	16	-----
40	-----	1	47	46	-----	1
861	4	-----	917	894	-----	23
167	-----	19	231	255	24	-----
1,183	34	-----	1,429	1,500	71	-----
378	33	-----	468	509	41	-----
1,262	23	-----	1,957	1,925	-----	32
9	1	-----	12	11	-----	1
617	18	-----	753	675	-----	78
65	9	-----	60	59	-----	1
2	-----	-----	4	3	-----	1
667	17	-----	289	251	-----	38
970	9	-----	760	605	-----	155
128	-----	1	113	101	-----	12
190	10	-----	189	140	-----	49
9	3	-----	-----	4	4	-----
543	-----	143	628	127	-----	501
149	-----	34	226	164	-----	62
98	-----	11	253	210	-----	43
682	86	-----	574	775	201	-----
8	-----	2	8	10	2	-----
395	42	-----	320	429	109	-----
825	49	-----	833	866	33	-----
243	14	-----	239	271	32	-----
245	-----	19	292	325	33	-----
373	35	-----	290	244	-----	46
220	44	-----	152	209	57	-----
11	2	-----	7	12	5	-----
157	-----	2	201	185	-----	16
22	-----	1	43	29	-----	14
22	1	-----	31	33	2	-----
56	14	-----	67	75	8	-----
168	8	-----	219	211	-----	8
54	-----	3	75	62	-----	13
106	14	-----	80	108	28	-----
7	-----	4	4	2	-----	2
65	7	-----	69	98	29	-----
1,062	105	-----	760	824	64	-----
924	88	-----	228	252	24	-----
487	-----	15	594	578	-----	16
316	2	-----	302	246	-----	56
345	16	-----	271	293	22	-----
1,127	107	-----	777	915	138	-----
624	-----	101	827	703	-----	124
96	16	-----	71	84	13	-----
556	-----	5	-----	415	415	-----
1,469	74	-----	1,768	1,572	-----	196
479	-----	14	317	291	-----	26
110	-----	17	177	157	-----	20
263	26	-----	273	208	-----	65
43	10	-----	53	63	10	-----
9	-----	-----	20	23	3	-----
1,177	14	-----	935	1,091	156	-----
52,057	2,559	2,396	47,234	44,872	4,301	6,663

NEGRO.—No. 4—Continued.

COUNTIES.	Hogs over six months old, 1876.	Hogs over six months old, 1877.	Increase.	Decrease.	Studs, jacks, and bulls, 1876.
Adair	179	300	121		
Allen	176	191	15		
Anderson					
Ballard	313	358	45		
Barren	296	247		49	
Bath	30	70	40		
Bell	17	10		7	
Boone	13	11		2	
Bourbon	45	165	120		
Boyd	11	21	10		
Boyle	34	13		21	
Bracken	61	104	43		
Breathitt	50	54	4		
Breckinridge	222	282	60		
Bullitt	138	162	24		
Butler	149	228	79		
Caldwell	97	153	56		
Calloway	84	286	202		
Campbell	9			9	
Carroll	9	37	28		
Carter	6	11	5		
Casey	96	130	34		
Christian	326	330	4		
Clark	89	199	110		
Clay	115	174	59		
Clinton	46	60	14		
Crittenden	168	215	47		
Cumberland	59	103	44		
Daviess	282	262		20	
Edmonson	76	81	5		
Estill	23	20		3	
Elliott	15	22	7		
Fayette					
Fleming	30	22		8	5
Floyd	14	33	19		
Franklin	69	123	54		
Fulton	69	47		22	
Gallatin	51	33		18	
Garrard	305	74		231	
Grant	23	12		11	
Graves	300	481	181		
Grayson	47	61	14		
Green	167	194	27		
Greenup	14			14	
Hancock	54	13		41	
Hardin	83	143	60		
Harlan	22	23	1		
Harrison	64	82	18		
Hart	368	365		3	
Henderson	343	480	137		1
Henry		14	14		
Hickman	102	300	198		
Hopkins	302	305	3		
Jackson	22	47	25		
Jefferson	64	62		2	
Jessamine	69	26		43	
Johnson					
Kenton	1	7	6		
Knox	107	93		14	
Larue	62	32		30	

NEGRO.—No. 4—Continued.

COUNTIES.	Hogs over six months old, 1876.	Hogs over six months old, 1877.	Increase.	Decrease.	Studs, jacks, and bulls, 1876.
Laurel	18	20	2		
Lawrence	27	45	18		
Lee	12	6		6	
Letcher	8	59	51		
Lewis		20	20		
Lincoln					
Livingston	172	230	58		
Logan	231	332	101		
Lyon	170	263	93		
Madison	216	217	1		1
Magoffin	9	11	2		
Marion	17	78	61		
Marshall	89	128	39		
Martin	3			3	
Mason	23	58	35		
McCracken	47	123	76		
McLean	28	25		3	
Meade	8	50	42		
Menifee	2			2	
Mercer	18	3		15	
Metcalfe	114	97		17	
Monroe	119	130	11		
Montgomery	93			93	
Morgan	2	4	2		
Mublenburg	161	201	40		
Nelson	95	135	40		
Nicholas	200	221	21		
Ohio	163	242	79		1
Oldham		25	25		
Owen	71	96	25		
Owsley	4	8	4		
Pendleton	124	116		8	
Perry	24	40	16		
Pike	20	27	7		
Powell	35	72	37		
Pulaski	110	129	19		
Robertson	26	34	8		
Rockcastle	12	77	65		
Rowan	15	2		13	
Russell	63	67	4		
Scott	89	91	2		
Shelby					
Simpson	173	171		2	
Spencer	22	15		7	
Taylor	218	290	72		
Todd	111	225	114		1
Trigg	159	123		36	
Trimble	6	34	28		
Union	241	253	12		
Warren	141			141	
Washington	5			5	
Wayne	46	50	4		
Webster	125	113		12	1
Whitley	15	24	9		
Wolfe	11	11			
Woodford	20	19		1	
Total	9,917	12,181	3,176	912	10

NEGRO.—No. 4—Continued.

[illegible]

NEGRO.—No. 4—Continued.

COUNTIES.	Tavern licenses, 1876.	Tavern licenses, 1877.	Increase.	Decrease.	Blacks that are blind, 1876.
Adair					
Allen					
Anderson					
Ballard					
Barren					
Bath					
Bell					
Boone					
Bourbon					
Boyd					
Boyle					
Bracken					
Breathitt					
Breckinridge					
Bullitt					
Butler					
Caldwell					
Calloway					
Campbell					
Carroll					
Carter					
Casey					
Christian					
Clark					
Clay					
Clinton					
Crittenden					
Cumberland					
Daviess					1
Edmonson					
Estill					
Elliott					
Fayette					
Fleming					
Floyd					
Franklin					
Fulton					
Gallatin					2
Garrard					
Grant					
Graves					
Grayson					
Green					
Greenup					
Hancock					
Hardin					
Harlan					
Harrison					
Hart					
Henderson					
Henry					
Hickman					
Hopkins					
Jackson					
Jefferson					
Jessamine					
Johnson					
Kenton					
Knox					
Larue					

NEGRO.—No. 4—Continued.

COUNTIES.	Tavern licenses, 1876	Tavern licenses, 1877.	Increase.	Decrease.	Blacks that are blind, 1876.
Laurel					
Lawrence					
Lee					
Letcher					
Lewis					
Lincoln					
Livingston					
Logan					1
Lyon					
Madison					
Magoffin					
Marion					
Marshall					
Martin					
Mason					
McCracken					
McLean					
Meade					
Menifee					
Mercer					
Metcalfe					
Monroe					
Montgomery					
Morgan					
Muhlenburg					
Nelson					
Nicholas					
Ohio					
Oldham					
Owen					
Owsley					
Pendleton					1
Perry					
Pike					
Powell					
Pulaski					
Robertson					
Rockcastle					
Rowan					
Russell					
Scott					
Shelby					
Simpson					
Spencer					
Taylor					
Todd					
Trigg					
Trimble					
Union	1				
Warren				1	
Washington					
Wayne					
Webster					
Whitley					
Wolfe					
Woodford					
Total	1			1	5

NEGRO.—No. 4—Continued.

[illegible]

NEGRO.—No. 4—Continued.

COUNTIES.	No. dogs over two, 1876.	No. dogs over two, 1877.	Increase.	Decrease.	Number of sheep killed by dogs, 1876.
Adair					
Allen					
Anderson					
Ballard		2	2		2
Barren	8	3		5	15
Bath		17	17		
Bell					
Boone	1	3	2		
Bourbon					
Boyd		1	1		
Boyle					
Bracken		3	3		
Breathitt					
Breckinridge	2			2	
Bullitt					
Butler					1
Caldwell	9	2		7	
Calloway					
Campbell					
Carroll					
Carter					
Casey					
Christian	12	7		5	
Clark	3	13	10		
Clay		1	1		3
Clinton					
Crittenden	1	3	2		
Cumberland					
Daviess	12			12	
Edmonson					
Estill					
Elliott					
Fayette		7	7		
Fleming	1			1	
Floyd					1
Franklin	1	3	2		
Fulton	1			1	
Gallatin					
Garrard	4			4	1
Grant		2	2		
Graves	3	1		2	4
Grayson					2
Green		1	1		
Greenup					
Hancock					
Hardin	7			7	
Harlan					
Harrison	2			2	
Hart					
Henderson	7	70	63		
Henry		4	4		
Hickman					
Hopkins	2			2	
Jackson					
Jefferson		22	22		22
Jessamine		2	2		
Johnson					
Kenton		3	3		
Knox					
Larue					

NEGRO.—No. 4—Continued.

COUNTIES.	No. dogs over two, 1876.	No. dogs over two, 1877.	Increase.	Decrease.	Number of sheep killed by dogs, 1876.
Laurel					
Lawrence					
Lee					
Letcher					
Lewis					
Lincoln	3			3	
Livingston	4	1		3	5
Logan	1	2	1		9
Lyon		1	1		4
Madison	1			1	
Magoffin					
Marion		10	10		
Marshall					1
Martin					
Mason		7	7		
McCracken		4	4		
McLean		9	9		
Meade					
Menifee					4
Mercer		1	1		
Metcalfe	2			2	
Monroe					
Montgomery		15	15		
Morgan					
Muhlenburg	1			1	10
Nelson	2	1		1	
Nicholas					
Ohio					1
Oldham	4			4	
Owen					1
Owsley					
Pendleton		2	2		
Perry					
Pike	1	1			
Powell					
Pulaski		1	1		
Robertson					
Rockcastle					
Rowan					
Russell	1			1	
Scott	9	6		3	
Shelby		7	7		
Simpson		1	1		
Spencer					
Taylor	2			2	1
Todd		1	1		
Trigg	1			1	
Trimble					
Union	5	24	19		10
Warren		1	1		
Washington					
Wayne					3
Webster					2
Whitley		1	1		
Wolfe					
Woodford	1	2	1		
Total	114	268	226	72	102

NEGRO.—No. 4—Continued.

Number of sheep killed by dogs, 1877.	Increase.	Decrease.	Value of sheep killed by dogs, 1876.	Value of sheep killed by dogs, 1877.	Increase.	Decrease.
2	2			\$4	\$4	
		5	\$10			\$10
		9	20			20
		4	8			8
		1	1			1
		4	8			8
3	3					
15	5		16	31	15	
1			2	2		
		1	4			4
2	2			4	4	
1	1			2	2	
2	1		2	4	2	
1	1			2	2	
		10	25			25
		3	6			6
		2	4			
2	2			4		
42	27	87	\$166	\$82	\$52	\$136

NEGRO.—No. 4—Continued.

COUNTIES.	Pounds of tobacco, 1876.	Pounds of tobacco, 1877.	Increase.	Decrease.	Pounds of hemp, 1876.
Adair	201,330	96,790		104,540	
Allen	76,420	50,070		26,350	
Anderson	200			200	
Ballard	220,416	213,700		6,716	
Barren	231,220	120,390		110,830	
Bath	220	520	300		
Bell	82	237	155		
Boone	6,400	4,600		1,800	
Bourbon		37,500	37,500		6,000
Boyd	50	92	42		
Boyle					
Bracken	80,200	83,500	3,300		
Breathitt	104	235	131		
Breckinridge	213,000	234,100	21,100		
Bullitt	549	1,470	921		
Butler	61,430	57,450		3,980	
Caldwell	249,900	51,210		203,660	
Calloway	131,400	58,100		73,300	
Campbell	200			200	
Carroll	35,300	74,800	39,500		
Carter	470	335		135	
Casey	3,382	1,540		1,842	
Christian	463,200	131,925		336,275	
Clark					2,000
Clay	994	1,122	128		
Clinton	11,020	7,525		3,495	
Crittenden	99,000	99,600	600		
Cumberland	105,800	81,250		24,550	
Daviess	281,570	566,800	285,230		
Edmonson	58,300	16,500		41,800	
Estill		95	95		
Elliott	105	100		5	
Fayette					
Fleming	16,000	12,700		3,300	
Floyd	110	248	138		
Franklin	10,505	12,682	2,177		
Fulton	19,400	9,250		10,150	
Gallatin	42,200	29,600		12,600	
Garrard	4,800			4,800	
Grant	15,460	24,100	8,700		
Graves	307,878	201,670		106,208	
Grayson	28,100	21,050		7,050	
Green	161,000	116,600		44,400	
Greenup					
Hancock	90,600	105,700	15,100		
Hardin	8,600	7,400		1,200	
Harlan	69	173	104		
Harrison	29,300	14,500		14,800	
Hart	277,417	170,528		106,889	
Henderson	455,190	750,640	295,450		
Henry	40,150	27,800		12,350	
Hickman	69,240	78,340	9,100		
Hopkins	312,000	210,300		101,700	
Jackson	50	245	195		
Jefferson					
Jessamine	54,000	450		53,550	
Johnson					
Kenton		2,000	2,000		
Knox	298	751	453		
Larue	14,250	16,900	2,650		

NEGRO.—No. 4—Continued.

Pounds of hemp, 1877.	Increase.	Decrease.	Tons of hay, 1876.	Tons of hay, 1877.	Increase.	Decrease.
			5	6	1	
			3	14	11	
			8	5		3
			1	4	4	
						1
				33	33	
		6,000		2	2	
			2	1		1
			7	12	5	
			28	18		10
				6	6	
			1	10	9	
			3	9	6	
			13			13
				1	1	
			10	7		3
			3	5	2	
		2,000	4	3		1
			1	4	3	
				3	3	
			1	7	6	
				2	2	
			5	11	6	
				1	1	
			4			4
			2			2
			4	16	12	
				30	30	
400	400		1			1
			2	3	1	
			311	43		268
				5	5	
			30	20		10
				1	1	
			1	3	2	
			3	1		2
			6			6
			4	15	11	
				7	7	
			1	2	1	
			121			121
74,700	74,700			12	12	
			2	13	11	

NEGRO.—No. 4—Continued.

COUNTIES.	Pounds of tobacco, 1876.	Pounds of tobacco, 1877.	Increase.	Decrease.	Pounds of hemp, 1876.
Laurel	125	305	180		
Lawrence	212	285	73		
Lee	170	265	95		
Letcher	56	881	825		
Lewis	1,000	1,600	600		
Lincoln					
Livingston	116,500	62,400		54,100	
Logan	426,805	104,930		321,875	
Lyon	149,341	45,985		103,356	
Madison	1,000	2,300	1,300		
Magoffin	40	180	140		
Marion	6,700	5,800		900	
Marshall	29,650	14,030		15,620	
Martin	30	25		5	
Mason	51,600	27,700		23,900	14,600
McCracken	51,100	93,850	42,750		
McLean	66,100	63,200		2,900	
Meade	31,500	18,500		13,000	
Menifee	30			30	
Mercer					
Metcalfe	58,577	47,249		11,328	
Monroe	46,400	32,750		13,650	
Montgomery	35			35	
Morgan	43	75	32		
Muhlenburg	198,550	110,435		88,115	
Nelson	25			25	
Nicholas	6,300	7,500	1,200		
Ohio	148,805	109,725		39,080	
Oldham	2,500	1,500		1,000	
Owen	48,021	95,400	47,379		
Owsley		15	15		
Pendleton	88,050	72,420		15,630	
Perry	91	145	54		
Pike	120	165	45		
Powell	403	590	187		
Pulaski	130	170	40		
Robertson	66,450	45,600		20,850	
Rockcastle	25	205	180		
Rowan					
Russell	14,950	17,550	2,600		
Scott	800	66,800	66,000		53,150
Shelby					
Simpson	176,198	40,815		135,383	
Spencer					
Taylor	147,235	93,100		54,135	
Todd	283,900	187,500		96,400	
Trigg	299,300	78,350		220,950	
Trimble	2,000	12,200	10,200		
Union	328,060	303,400		24,660	
Warren	251,550	189,545		62,005	
Washington					
Wayne	330	50		280	
Weiser	217,750	81,000		136,750	
Whitley					
Wolfe	195	62		133	
Woodford					12,400
Total	7,817,571	5,841,765	898,964	2,874,770	88,150

NEGRO.—No. 4—Continued.

Pounds of hemp, 1877.	Increase.	Decrease.	Tons of hay, 1876.	Tons of hay, 1877.	Increase.	Decrease.
				1	1	
			3	2		1
				1	1	
			5			5
			16	3		13
			5	10	5	
			4	1		3
			3			3
				7	7	
			1	1		
4,000		10,600				
				11	11	
				1	1	
			16	21	5	
			1	1		
			10	24	14	
			5	11	6	
			4	4		
			9	18	9	
			2	2		
			1			1
				12	12	
			4	5	1	
			1			1
			1	5	4	
		53,150	4	1		3
				1	1	
			3	3		
			5	6	1	
			1	2	1	
			2	6	4	
			17	13		4
			8	16	8	
				101	101	
				1	1	
			1	1		
27,500	15,100		100	2		98
106 600	90,200	71,750	819	629	388	578

NEGRO.—No. 4—Continued.

COUNTIES.	Bushels of corn, 1876.	Bushels of corn, 1877.	Increase.	Decrease.	Bushels of wheat, 1876.
Adair	43,028	54,330	11,302		1,944
Allen	28,995	32,050	3,055		1,745
Anderson	3,825	4,380	555		200
Ballard	25,041	30,055	5,014		3,197
Barren	34,070	35,540	1,470		1,269
Bath	9,850	10,050	200		290
Bell	2,905	3,250	345		40
Boone	4,650	4,150		500	
Bourbon	10,260	9,850		410	509
Boyd	565	990	425		
Boyle	3,225	1,175		2,050	435
Bracken	7,255	8,225	970		415
Breathitt	3,345	2,420		925	
Breckinridge	34,800	28,650		6,150	1,160
Bullitt	17,555	29,125	11,570		640
Butler	8,530	18,398	9,868		568
Caldwell	28,640	20,285		8,355	730
Calloway	21,340	20,300		1,040	1,326
Campbell	2,550			2,550	137
Carroll	7,760	7,800	40		20
Carter	1,575	2,690	1,115		
Casey	12,082	10,645		1,437	387
Christian	48,700	44,705		3,995	4,930
Clark	9,220	7,735		1,485	830
Clay	12,106	9,163		2,943	40
Clinton	3,985	4,645	660		185
Crittenden	22,070	23,550	1,480		748
Cumberland	18,339	14,800		3,539	804
Daviess	25,395	35,159	9,764		620
Edmonson	12,320	16,000	3,680		800
Estill	4,100	3,350		750	70
Elliott	725	990	265		75
Fayette					
Fleming	7,170	5,450		1,720	395
Floyd	2,630	2,635	5		
Franklin	11,532	16,955	5,423		332
Fulton	15,100	14,050		1,050	1,021
Gallatin	11,700	5,700		6,000	100
Garrard	41,855	9,405		32,450	3,350
Grant	3,450	3,710	260		
Graves	37,047	34,603		2,444	1,775
Grayson	4,830	4,560		270	205
Green	27,530	25,665		1,865	1,325
Greenup	6,510	7,560	1,050		160
Hancock	10,000	8,690		1,310	570
Hardin	16,410	16,640	230		1,820
Harlan	1,538	1,950	412		4
Harrison	19,330	18,830		500	1,110
Hart	46,967	50,521	3,554		4,315
Henderson	45,115	47,572	2,457		1,842
Henry	7,455	2,550		4,905	25
Hickman	26,653	31,698	5,045		3,929
Hopkins	141,135	33,600		107,535	2,275
Jackson	1,225	3,600	2,375		25
Jefferson	25,010	11,440		13,570	2,480
Jessamine	11,185	10,618		567	1,405
Johnson		90	90		
Kenton					
Knox	10,345	13,030	2,685		186
Larue	7,385	6,100		1,285	1,186

NEGRO.—No. 4—Continued.

Bushels of wheat, 1877.	Increase.	Decrease.	Bushels of barley, 1876.	Bushels of barley, 1877.	Increase.	Decrease.
3,093	1,149					
1,522		223				
127		73				
2,777		420				
1,475	206			50	50	
300	10					
		40				
700	191					
33	33					
254		181				
230		185				
3	3					
1,370	210					
533		107				
1,206	638					
769	39					
1,400	74					
		137	33			33
65	45					
194		193				
9,250	4,320					
550		280				
23		17				
355	176					
1,109	361					
971	167					
2,489	1,869					
701		99				
50		20				
35		40				
315		80				
580	248					
868		153				
100						
1,070		2,280				
3,044	1,269					
225	20					
2,045	720					
100		60				
420		150				
1,500		320		50	50	
		4				
1,050		60				
5,100	785					
2,544	702					
40	15					
1,548		2,381				
2,669	394					
		25				
1,780		700				
1,605	200					
407	221					
280		90				

NEGRO.—No. 4—Continued.

COUNTIES.	Bushels of corn, 1876.	Bushels of corn, 1877.	Increase.	Decrease.	Bushels of wheat, 1876.
Laurel	2,005	3,265	1,260		27
Lawrence	4,517	4,285		232	60
Lee	1,300	2,140	840		42
Letcher	1,045	1,995	950		62
Lewis	1,550	1,470		80	
Lincoln	3,625			3,625	190
Livingston	23,280	14,115		9,165	278
Logan	72,390	53,985		18,405	4,240
Lyon	28,564	25,016		3,548	891
Madison	88,950	69,030		19,920	1,290
Magoffin	1,155	1,500	345		
Marion	6,700	17,545	10,845		470
Marshall	7,080	7,079		1	323
Martin	150	425	275		
Mason	6,250	4,500		1,750	600
McCracken	8,950	11,075	2,125		266
McLean	6,055	4,770		1,285	499
Meade	13,500	9,050		4,450	990
Menifee	75	150	75		15
Mercer	13,300	13,530	230		1,004
Metcalf	11,007	12,020	1,013		837
Monroe	8,845	10,395	1,550		690
Montgomery	4,710			4,710	212
Morgan	718	2,035	1,317		
Muhlenburg	23,131	28,445	5,314		2,091
Nelson	23,270	34,845	11,575		1,495
Nicholas	9,725	10,440	715		423
Ohio	21,045	20,270		775	1,480
Oldham	7,050	850		6,200	150
Owen	9,170	14,656	5,486		180
Owsley	675	535		140	
Pendleton	12,495	11,695		800	467
Perry	801	1,105	304		
Pike	2,205	4,425	2,220		8
Powell	3,350	4,734	1,384		62
Pulaski	11,015	9,495		1,520	563
Robertson	6,980	8,290	1,310		330
Rockcastle	3,650	7,100	3,450		65
Rowan	200	1,200	1,000		
Russell	7,100	10,385	3,285		364
Scott	30,585	28,655		1,930	1,236
Shelby					
Simpson	30,445	24,980		5,465	3,838
Spencer	9,490	8,785		705	553
Taylor	20,380	22,625	2,245		842
Todd	24,470	23,095		1,375	995
Trigg	33,575	28,332		5,243	1,867
Trimble	400	2,000	1,600		
Union	49,350	50,465	1,115		1,848
Warren	59,090	96,115	37,025		2,252
Washington	15,150	9,500		5,650	1,332
Wayne	9,435	5,270		4,165	282
Webster	23,440	8,810		14,630	1,495
Whitley	1,225	4,170	2,945		
Wolfe	665	625		40	
Woodford	7,430	6,000		1,430	700
Total	1,780,626	1,638,949	187,162	328,839	91,853

NEGRO.—No. 4—Continued.

Bushels of wheat, 1877.	Increase.	Decrease.	Bushels of barley, 1876.	Bushels of barley, 1877.	Increase.	Decrease.
60	33					
20		40				
		42				
10		52				
140	140					
		190				
596	318					
4,027		213				
1,332	441					
860		430				
		15				
455						
511	188					
200		400				
690	424					
235		264				
335		655				
		15				
1,161	157					
734		103				
1,080	390					
		212				
10	10					
2,692	601					
1,573	78					
382		41				
1,544	64					
		150				
91		89				
495	28					
		8				
52		10				
576	13					
320		10				
160	95					
424	60					
2,091	855			500	500	
2,443		1,395	15			15
421		132				
1,414	572					
3,145	2,150					
2,329	462					
1,599		249				
4,417	2,165					
580		752				
243		39				
660		835				
40	40					
8	8					
1,000	300					
100,029	23,651	15,475	48	600	600	48

INDEX.

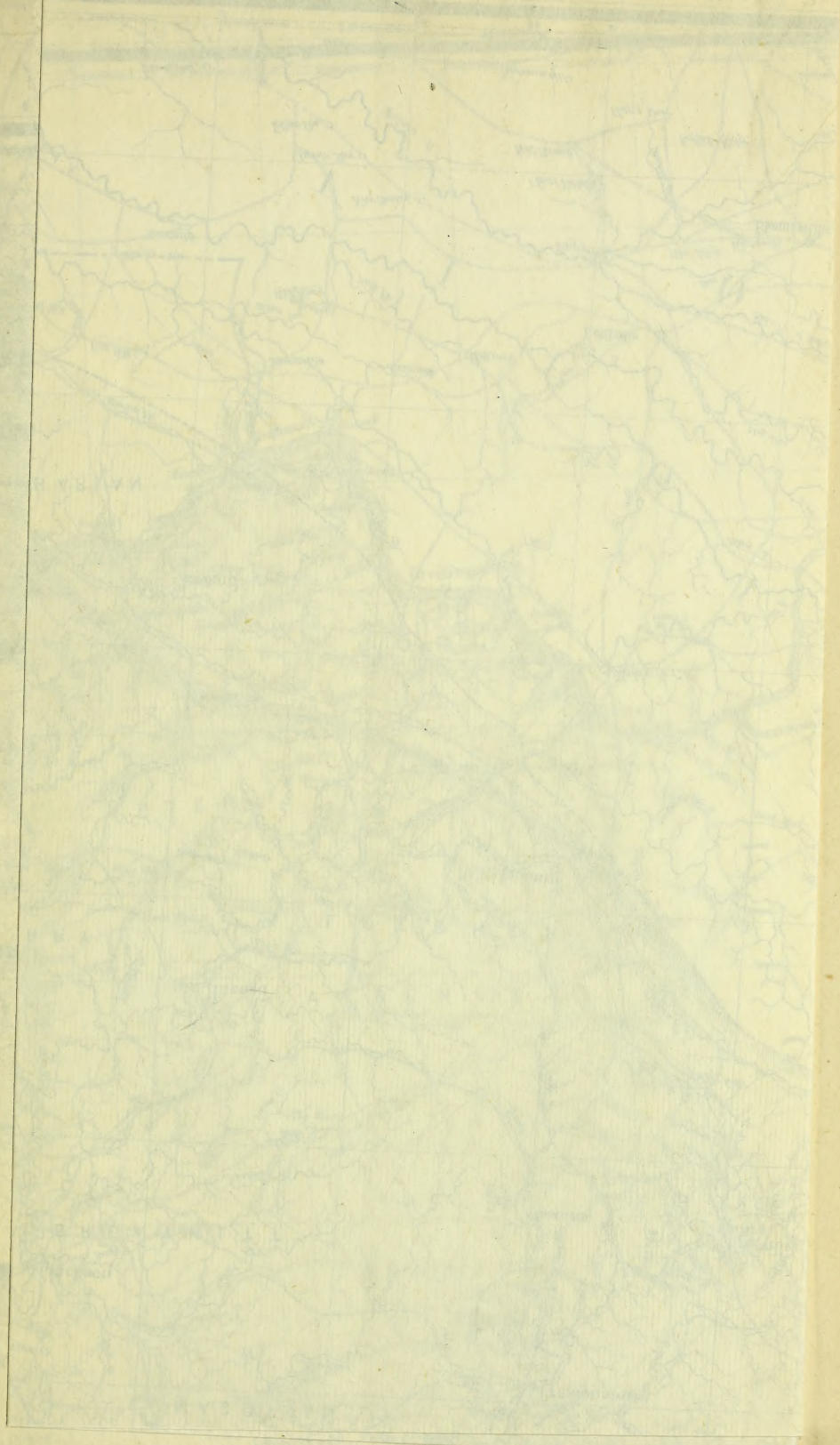
	PAGE.
Agricultural Bureau	213
Agricultural societies and fairs.	209
Agricultural tables—sundry items	648
Agriculture	60, 75, 109
Apples, list of	625
Asylums and eleemosynary institutions.	232 <i>c</i>
Bee culture—honey.	155
Big Sandy Valley, geology of	44
Building material in the State	56
Blind Asylum	232 <i>d</i>
Bureau of Agriculture, Horticulture, and Statistics	213
Capital, investment of	35
Cherries, list of, and other fruits.	628
Cholera in hogs and chickens	620
Cisterns, construction of, and use	232 <i>e</i>
Cities and towns (the ten largest)	91
Climate.	21
Coal regions (see the counties).	10, 16, 44, 47, 54, 55
Coal oil, its origin and resources of.	173
College, State Agricultural and Mechanical.	630
Corn and other cereals	140
Crops and crop systems in the State	140
Crop, statistical and other tables.	648
Cumberland river.	15
Dairying, method and profits of	151
Deaf and Dumb Asylum	232 <i>d</i>
Description of county of Adair	233
Allen	235
Anderson	239
Ballard	242
Barren	245
Bath	248
Bell	252
Boone	255
Bourbon	258
Boyd	262
Boyle	265
Bracken	270
Breathitt.	272
Breckinridge	275
Bullitt	278

	PAGE.
Description of county of Butler	181
Caldwell	184
Calloway	288
Campbell	291
Carroll	295
Carter	298
Casey	301
Christian	304
Clark	312
Clay	316
Clinton	319
Crittenden	321
Cumberland	325
Daviess	328
Edmonson	332
Elliott	335
Estill	338
Fayette	342
Fleming	345
Floyd	348
Franklin	351
Fulton	355
Gallatin	358
Garrard	361
Grant	364
Graves	367
Grayson	371
Green	375
Greenup	377
Hancock	380
Hardin	383
Harlan	385
Harrison	389
Hart	392
Henderson	395
Henry	398
Hickman	401
Hopkins	404
Jackson	408
Jefferson	411
Jessamine	416
Johnson	419
Kenton	422
Knox	426
Larue	429
Laurel	433
Lawrence	436

	PAGE.
Description of county of Lee	439
Letcher	443
Lewis	447
Lincoln	450
Livingston	453
Logan	455
Lyon	459
Madison	462
Magoffin	468
Marion	471
Marshall	474
Martin	477
Mason	480
McCracken	484
McLean	488
Meade	491
Meniffee	493
Mercer	496
Metcalfe	500
Monroe	503
Montgomery	505
Morgan	509
Muhlenburg	512
Nelson	516
Nicholas	520
Ohio	523
Oldham	527
Owen	530
Owsley	533
Pendleton	536
Perry	540
Pike	542
Powell	545
Pulaski	548
Robertson	551
Rockcastle	553
Rowan	556
Russell	560
Scott	563
Shelby	566
Simpson	570
Spencer	573
Taylor	576
Todd	579
Trigg	582
Trimble	586
Union	589

	PAGE.
Description of county of Warren	592
Washington	596
Wayne	599
Webster	603
Whitley	606
Wolfe	610
Woodford	613
Deterioration of apples, grapes, &c., cause of	624
Domestication of wild fowls.	632
Domestic arts (see counties).	83
Drainage, method and use of	136
Duty on tobacco in foreign States	148
Education in the State (see counties).	38, 86
Emigrants, why they should come to Kentucky.	103
Emigrants, instructions to, in traveling, &c.. . . .	106
Entomology, injurious insects.	139
Expenditures of the State, table of.	642
Fair associations.	212
Feeble-minded Institute.	232 <i>d</i>
Fences, cost of.	618
Fertilization and preservation of soils	124
Forestry, planting trees, and their value	163
Formulas of fertilizers for various crops	138
Fowls, wild, domestication of	632
Fruit growing in Kentucky	75, 628
Fungi, vegetable parasites, and mushrooms.	180
Geology, general, of Kentucky	2
Geography, general, of Kentucky	1
Government of Kentucky.	38, 633
Granges, remarks on the	216
Grape culture—wine-making	217, 596
Grasses, meadows, flax, hemp, &c.. . . .	117, 140
Green crops, utility of	131
Green river	13
Hanging Rock Iron Region.	67
Hog cholera, animal parasites.	620
Horticulture	75, 203
Iron ores in Kentucky (see counties).	63, 67, 69, 72
Lands, prices of (tables), in each county	32, 645
Licking river	9
Louisville, statistics, &c., of.	91, 232 <i>j</i>
Mammoth Cave.	232 <i>p</i> , 332
Manufacturing capacity of Kentucky	83, 232 <i>m</i>
Manures, fertilizers, &c.. . . .	135
Markets and transportation	27
Marl beds (see counties)	57
Meadows and grasses.	117
Men, table of measurement and size of.	23

	PAGE.
Minerals in Kentucky	55
Mushrooms, eatable and poisonous.	180
Newspapers and periodicals in the State	639
Nolan River district ores	72
Officers of the State government.	633
Orchards of various fruits, lists of trees	622
Parasites, animal and vegetable	180, 217, 620
Peaches, list of choice varieties	627
Pears, cultivation of	232
Pisciculture, the State fish laws	162
Plums and damsons, a list of	637
Poultry, its profits, &c.	161
Railroad systems, narrow-gauge	28, 53, 201
Rain-fall in Kentucky, tables of	232 <i>e</i>
Representatives in the General Assembly, list of.	637
Revenue receipts and expenditures, tables of	642, 644
River systems of the State	7
Rust on wheat, causes of	180
Scenery, grandeur of (see counties)	25
Senators in the General Assembly, list of	636
Slack-water navigation	195
Smut in wheat, corn, &c.	180
Societies, agricultural, &c.	209
Soils (see counties)	19, 124
Statistical tables (Nos. 1, 2, 3, 4)	641
Stock, live, in the State (see tables).	99, 641
Subsoiling, its use	25, 125
Taxes of the State	38, 103
Tennessee river	17
Timber, value of	163, 618
Tobacco, statistics, duty, &c.	61, 140, 148
Towns and cities (ten largest)	91
Tradewater river	14
Transportation and markets	27
Valuation tables, &c.	647
Vineyards and wine-making	217, 596, 620
Water-ways, water-power	19, 53
Western coal fields	45
Wheat, barley, rye, oats, corn, &c.	140



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